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ASTOUNDING Science-fiction

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APRIL 1944

25 CENTS

THE CHANGELING

BY A. E. VAN VOGT

ASTOUNDING SCIENCE-FICTION — APRIL 1944

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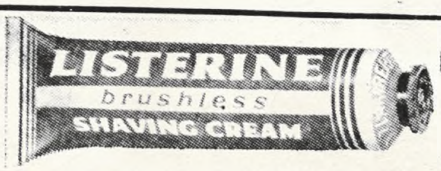

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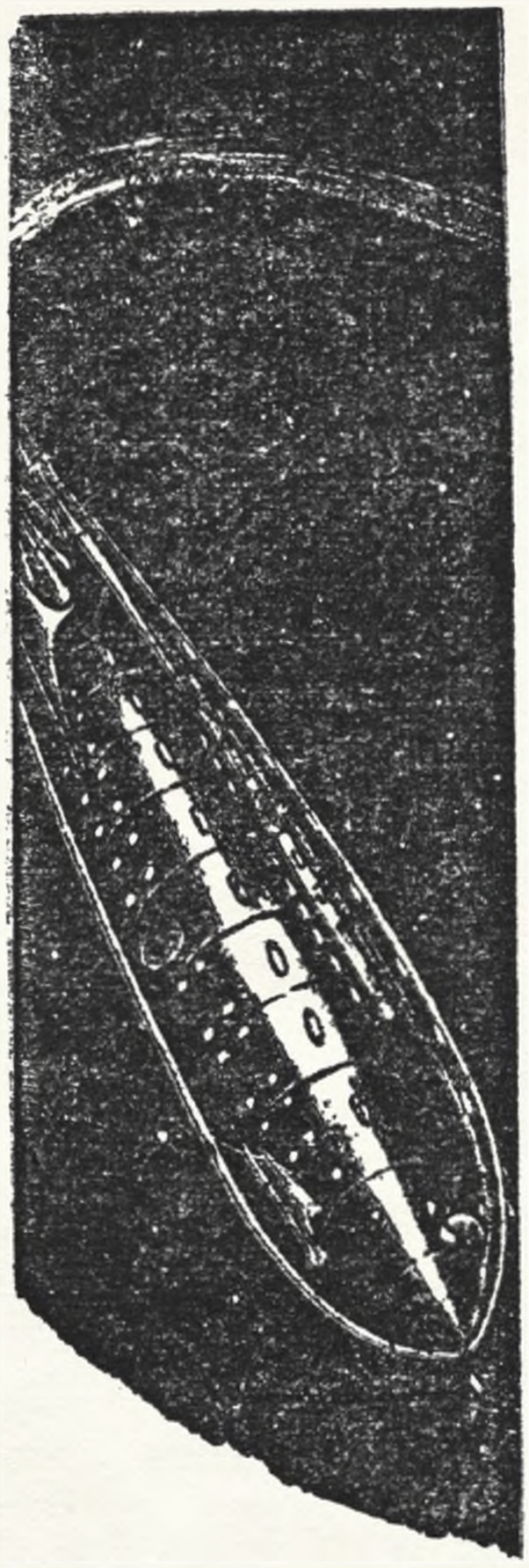

ASTOUNDING SCIENCE FICTION

Reg. U. S. Pat. Off.

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Super-Conservative

It has long been maintained that science-fiction is written by, edited by, and read by wild-eyed dreamers, with a raving imagination, and that it consists solely of impossible fantasies. Ask any non-reader. Or—maybe you'd better not, just now. The non-readers have been somewhat shocked very recently, and might possibly be a little less certain of the one hundred percent standing of science-fiction as pure fantasy. The jet-propelled plane comes dangerously close to making a rocket-propelled ship sound almost as though it might, a thousand years hence, be remotely possible—

Personally, I've long maintained that science-fiction is conservative. Any soundly managed business prepares provisional estimates of trends of the next few years; in a heavy-equipment industry, where equipment for the operating plant is massive, extensive, and slow in manufacture, five-year estimates of trends are a minimum requirement. A public utility power system, the telephone system, and similar enterprises must make estimates of rate of growth for ten years, and frequently as much as twenty years in the future. (The telephone engineer needs, say, one hundred new lines into area A. That number could be arranged with a small, overhead cable. But if growth in the next ten years will require five hundred new lines, buried cable is called for. It would be cheaper to install the buried cable in the first place, if that is going to be needed in the end. Which to use—?)

Forecasting fifty years is certainly standard, conservative practice, if our business is to be an effort at visualizing the world of tomorrow. And at that, gentlemen, I would like to point out that science-fiction's record is perfectly terrible. We claim to be looking straight ahead into the future; the non-readers claim we've got our heads in the clouds—or a dense fog, at any rate—but the facts seem to be that we've got our directions badly confused. We're looking at our toes.

We did not predict the electron microscope; that was handed to us by the professional scientists. We got so interested in rocket ships we missed the jet-propelled plane, a far more useful device for atmosphere travel. And now it appears we have completely missed the most important item of this century.

The rotogravure section is the first part of the magazine to be made up. The material on jet propulsion was already made up and available when the news of "The Squirt" came through, otherwise we might have been too late on that one. It was definitely too late for me to include the article that will be in next month; I can only give a brief indication of it here, now.

Dr. Felix Ehrenhaft, a first-rank physicist, has developed proofs of the existence of magnetic current, of magnetic ions—i.e., singly-charged magnetic ions, the long-denied free north poles and free south poles. These items tend to seem rather small, of the "interesting, I suppose" order, until a little further thought on the matter is invested.

A magnetic *current* is not a magnetic *field*—as a matter of fact, it's the vanishment of a magnetic field. The difference is as great as the difference between static electricity, known to the Greeks, and current electricity, on which the last fifty years of science is solidly based. All of our research in physics, particularly atomic physics, has been vastly aided, or even made possible, by the use of the electric current. When the electric cell made electric current available for the first time, there was an almost immediate rush of discovery of new chemical ele-

ments. More recently, medicine has benefited by the electrocardiograph and the encephalograph as direct applications of current electricity, and by the electron microscope. All communications beyond the range of a strong pair of lungs and a leather throat depends on current electricity.

But static electricity? Well, of course the electrostatic field is bound to exist wherever electric current is used, but there's very little use for static electricity. The van der Graff atomic research generator is about the only use.

Magnetostats — permanent magnets — are extremely useful, of course. But we have never had magnetic current to work with. We've never known it existed. We've never known that unit north charges existed. We, as a matter of fact, "don't know nuffin' from nowhars!" Since magnetic unit charges, both north and south, exist, they force us to accept the idea that somewhere in the structure of matter, is a particle bearing a unit magnetic charge.

Perhaps the electron, for instance, is both a unit negative and a unit north charge. Do you realize what that would mean? To begin with, the ratio of charge to mass of the electron is determined by the ratio of magnetic to electrostatic deflection of a beam of cathode rays—electrons. *But*—if those electrons are also magnetically charged, there's an unsuspected contaminant in the materials. Then we do *not* know the ratio of charge to mass. Then we do *not* know the mass of an electron, nor the mass of a proton, nor several hundred other basic constants of physics!

Obviously our concept of atomic structure is wrong; it has no place of course for a magnetic charge.

Further, our concepts of cosmology will have to be changed. The sunspots show definitely that enormous magnetic influences are at work in the Sun. The whole concept of stellar structure will be altered when we add the new knowledge to our calculations of atomic reactions.

On the industrial level, consider this: a so-called "electric" motor is, of course, a magnetic motor. Electric current is used to generate magnetic potential. (Magnetic fields are directly comparable to electric fields; they represent potential.) The magnetic potential, not the electric current, is the direct cause of the motor's rotation. Then why not simply ship in magnetic power directly, and heave the expensive, complicated electric-current coils out of the way?

Electrie current kills people. Magnetic current seems to be basically different in nature—no one has ever gotten a shock from a magnet. Perhaps it's inherently nonfatal?

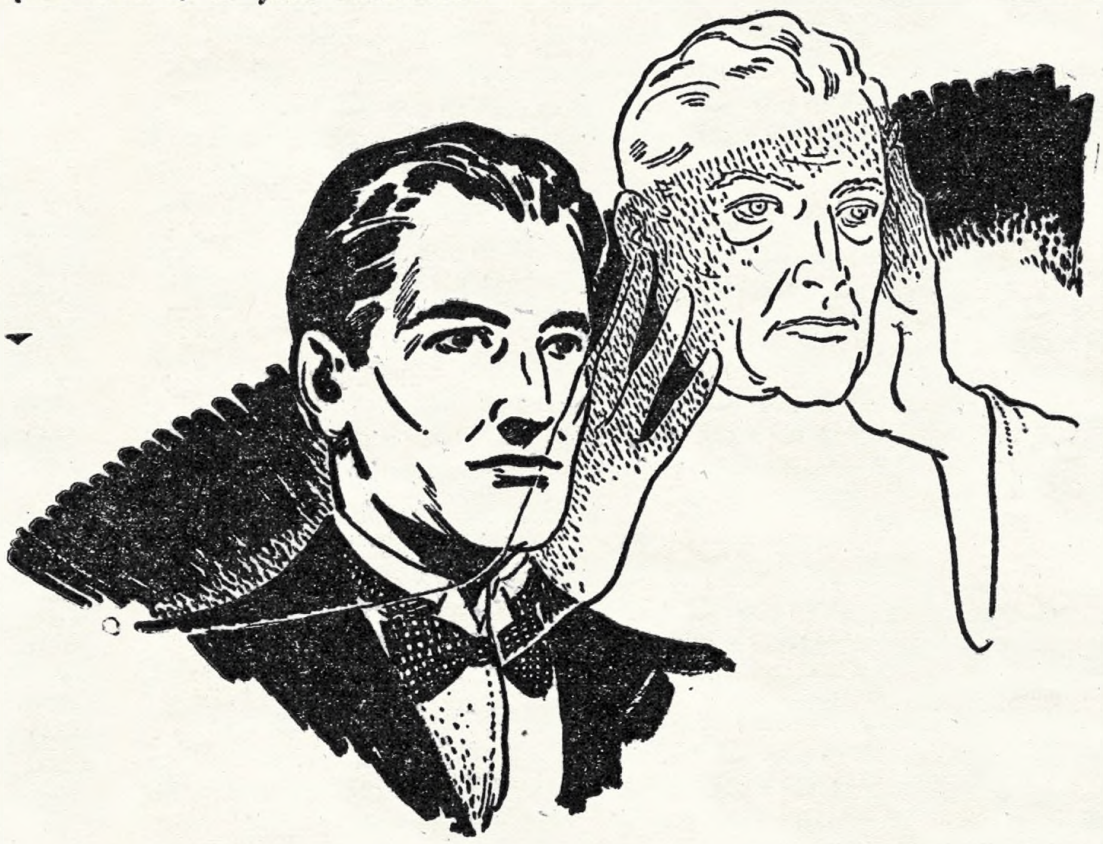
Dr. Ehrenhaft has demonstrated that the magnetic potential of a "permanent" magnet can be tapped, and made to perform work—the magnetolysis of water, yielding, of course, hydrogen and oxygen. The pole-strength of the magnet used, naturally, decreases as its store of energy is consumed. Magnetic current can cause chemical action; it's a fair assumption that the right set-up will yield a magnetic current from chemical reaction.

What constitutes a magnetic conductor? What a magnetic insulator? No one knows yet—but remember that an electric field penetrates a nonconductor, and is blocked by a grounded conductor. Soft iron is the best magnetic conductor yet found, but we know it's a bad one. (If it were good, the Faraday Cage experiment would work for magnetic fields and iron wires.)

Lack of space now prevents an adequate discussion of this discovery. Next month's issue will contain photographs, and more detailed reports. For the moment: Dr. Ehrenhaft, having made the most important discovery of this century—I do not except the uranium fission—will most certainly receive that final honorary degree, the degree no college confers, but which is conferred only by the people who find his name forever in their conversation. He will be not Dr. Ehrenhaft to the future, but Ehrenhaft. Probably, as a matter of fact, he will be perpetuated as an ehrenhaft.

THE EDITOR.

He didn't know who he was. And then he found his wife, his employer, his servants were banded in a plot that gave him a huge income, a fine home, a fine business!



The Changeling

by A. E. VAN VOGT

Illustrated by Orban

"In the four years since you've been here," said Nypers, "this firm has done very well."

Craig laughed. "You will have your joke, Nypers. What do you mean, in the four years since I've been here? Why, I've been here so long, I feel like a graybeard."

Nypers nodded his thin, wise head. "I know how it is, sir. Everything else grows vague and unreal. There's a sense as if another personality has lived that past life."

He turned away. "Well, I'll leave the Winthrop contract with you."

Craig finally withdrew his astounded gaze from the impassive panels of the oak door beyond which the old clerk had vanished. He shook his head wonderingly, then in self-annoyance. But he grinned as he sat down at the desk.

Nypers must be feeling his oats this morning. First time the old wretch had ventured within shooting distance of an attempt at humor.

In the four years since you—let's see now, how long *had* he been manager of the Nesbitt Co.? Office boy at sixteen; that was in 1938, junior clerk at nineteen, then the war. He'd joined up in April, 1942, been wounded, hospitalized and sent home early in '44. Back to the Nesbitt Co. to become successively senior clerk in 1949, office manager in '53, and general manager in '60. Since then, well, the days in an office were pretty much alike. Time blew by like a steady north wind.

Here it was 1972. Hm-m-m, thirty-four years with the firm, not counting the war, twelve as general manager. That made him exactly fifty this year. He—

Fifty?

With a faint cry, Craig leaped to his feet, and raced into the washroom adjoining his private office. There was a full-length mirror in the door of the glittering shower booth.

The image that met his gaze was satisfyingly familiar. It was that of a tall, powerfully built young man about six feet tall and thirty-three or -four years of age.

Craig recovered his calmness. One of those perpetual juvenile types, he told himself in amusement. Didn't look a day over forty. Odd though that it had never occurred to him that he was fifty.

He allowed himself a glow of pleasure at the realization that he was holding up so beautifully. Anrella, too, for that matter. If he didn't look forty, she didn't look thirty. She—

His mind faltered. He went back into the office, sat down heavily in his chair. And sat there. The sober thought came:

What was going on here? *In the four years since you've been with this firm—* The words made a pattern in his mind, then a jangle, as if each one was a piece of loose metal banging around in his head.

The action he took finally was semiautomatic. He pressed a button on his desk.

The door opened, and a scrawny, white-faced woman of thirty-five or so came in.

"You called, Mr. Craig?"

Craig hesitated. The whole business was crazy, impossible, fantastic. He was a class A idiot, a tenth rate fool, a—

"Miss Pearson," he said, "how long have you been with the Nesbitt Co.?"

The woman looked at him sharply; and Craig remembered too late that in these days of complete feminine emancipation, an em-

ployer didn't ask a female employee questions that might be construed as not being related to business.

After a moment, Miss Pearson's eyes lost their hard hostile gleam; and Craig breathed easier.

"Nine years!" she said curtly.

"Who"—Craig forced himself to say it—"hired you?"

Miss Pearson shrugged, but the gesture must have been in connection with something in her own mind. Her voice was normal, as she said:

"Why, the then manager. Mr. Letstone."

"Oh!" said Craig.

Almost, he pointed out that he had been general manager for the past twelve years. It wasn't that he stopped himself from speaking either. The thought behind the words simply skittered off into vagueness.

His mind poised quite blank, and accordingly unconfused. Even the idea that came finally was logical and unblurred. He voiced it in a calm tone:

"Bring me the Personnel Accounts book for 1968, please."

"Yes, Mr. Craig."

Craig opened the book at SALARIES for the month of October. And there it was: "Lesley Craig, general manager, $1250."

September had the same entry. Impatient, he thumbed back to January. It read:

Angus Letstone, general manager, $700.

There was no explanation for the lower pay. February, March, April were all Angus Letstone. All at $700 a month.

In May the name of Lesley Craig appeared for the first time at $1250.

Four years! In the four years since you—

The Winthrop contract lay unread on the great oak desk. Craig stood up, and went over and stared out of the vitreous glass windows that made a curving design at the corner of the room.

A broad avenue spread below him, a tree-lined boulevard glittering with gorgeous buildings. Money had flowed into this street—and into this room. When he thought of how often he had believed himself one of those fortunate men at the lower end of the big income class who had attained the top position in their company after years of toil and—

Ruefully, Craig allowed the thought to trail off. The years of toil hadn't occurred. The question therefore was: how had he got this perfect job with its pleasant salary, its exclusive clientele, its smoothly operating organization?

Life had been as lovely and sweet as a drink of clear, cold water, an untroubled idyll, a simple design of happy living.

And now this!

How in the name of anything did a man find out what he had done during the forty-six years of his life? Especially, how did he find it out when he didn't look forty-six—let alone fifty—by more than a dozen years?

There were, of course, a few simple facts that he could verify be-

fore taking any other action. With abrupt decision Craig returned to his desk, picked up his dictaphone, and began:

"Records Department, War Office, Washington, D. C. Dear Sirs: Please send as soon as possible my record for World War II. I was in the—"

He explained in detail, gathering confidence as he went along. His memory was so very clear on the main facts. The actual army life, the battles were vague and far away. But that was understandable. There was that trip Anrella and he had taken to Canada last year. It was a dim dream now, with only here and there flashes of mental pictures to verify that it had ever happened.

All life was a process of forgetting the past.

His second letter he addressed to Birth Record Statistics, Chicago, Illinois. "I was born," he dictated, "on June 1, 1922, in the town of Daren, Illinois. Please send my birth certificate as soon as possible."

He rang for Miss Pearson, and gave her the dictaphone record when she came in.

"Verify those addresses," he instructed briskly. "I believe there's some small charge involved. Find out what, inclose money orders and send both letters air mail."

He felt pleased with himself when she had gone out. No use getting excited about this business. After all, here he was, solid in his job, his mind as steady as a rock. There was no reason to let himself become upset, and even less cause for allowing others to discover his predicament.

In due course the answers would arrive to his two letters. Time enough then to pursue the matter further.

He picked up the Winthrop contract, and began to read it.

Twenty minutes later, it struck him with a shock that he had spent most of the time striving to remember just what he had been doing during May, 1968.

That was the month the first rocket had reached the moon. Mentally, Craig pictured the newspaper headlines, as he had seen them.

And there was no doubt. He *had* seen them. Big and black, they loomed in his mind. He could regard May, his first month with the Nesbitt Co.—according to the salary records—as part of the continuity of his present existence.

What about April? In April there had been the internal squabble that had nearly split wide open the powerful union of women's clubs. And the headlines had been—

Had been what? Craig strained with his brain, but nothing came. He thought: what about May 1st? If April's end and May's beginning had been the dividing line, then May 1st should perhaps have some special quality of aliveness that would mark it as sharply as a lover's first kiss. He had been sick somewhere around there—

But his mind wouldn't pin down the day. Presumably he had had breakfast. Presumably he had

gone off to the office after receiving one of Anrella's lingering good-bye kisses.

His mind poised in mid-flight like an animal that has been shot on the run. Anrella? he thought violently. She must have been there on April 30th and 29th and in March, February, January, and back and back.

There was not in his whole memory the suggestion, nor had there been in her actions during the vital month of May, that they hadn't been married for years.

Therefore—*Anrella knew!*

It was a realization that had its emotional limitations. The curious dartings of his mind at the first sharp awareness of the idea were caught in the net of a quieter logic, and grew calm.

So Anrella knew. Well, so she ought. He had obviously been around for many years. Any change that had occurred had taken place in his mind, not in hers.

Craig glanced at the wall clock: a quarter to twelve. He'd just have time to drive home for lunch. He usually had lunch in town, but this was different. The information he wanted couldn't wait.

A number of good-looking women were standing in the hallway as he headed for the elevator. The impression that they looked at him sharply as he passed was so strong that Craig was torn out of his own tempestuous thoughts. He turned and looked back.

One of the women was saying something into a little, shining device on her wrist.

Almost blankly, Craig thought: "A magic jewel radio."

He was in the elevator then; and he forgot the incident during the space of the downward trip. There were women in the lobby, as he emerged from the elevator, and still others in the entranceway. At the curb stood half a dozen imposing black cars with a woman driver behind each steering wheel.

In a few minutes, the street would be swarming with the noon rush crowds. But now, except for the women, it was almost deserted.

"Mr. Craig?"

Craig turned. It was one of the young women who had been standing just outside the entranceway, a brisk-looking creature with a strangely stern face.

Craig stared at her, then: "Uh!" he said.

"You are Mr. Lesley Craig?"

Craig emerged further out of his half reverie. "Why, yes, I . . what—"

"O. K., girls," said the young woman.

Amazingly, guns appeared. They glittered metallically in the sun. Before Craig could more than blink at them hands caught his arms, and propelled him towards one of the limousines.

He could have resisted. But he didn't. He had no sense of danger. In his brain was simply an enormous and paralyzing astonishment. He was inside the car, and the long machine was moving, before his mind resumed its functioning.

"Say, look here!" he began.

"Please do not ask any questions, Mr. Craig." It was the young woman who had already spoken to him; she sat now at his right. "You are not going to be hurt—unless you misbehave."

As if to illustrate the threat, the two women who sat on small pull-down center seats facing him with drawn revolvers, wiggled their shiny weapons meaningfully.

After a minute, it was still not a dream. Craig said:

"Where are you taking me?"

"Ask no questions. Please!"

That brought impatience, a sense of being treated like a child. Grim, furious, Craig leaned back, and with hostile eyes studied his captors.

They were typical, short-skirted "new" women. The two gun-women looked well over forty, yet they were slenderly, lithely built; their eyes had the very bright look of women who had taken the Equalizer—Makes you the Equal of a Man—drug treatment.

The young woman leader and the girl on Craig's left had the same bright-eyed appearance.

They all looked capable.

Before Craig could think further, the machine twisted around a corner, and up a long, slanting incline of pavement. Craig had time to recognize that this was the garage entrance to the skyscraper McCandless Hotel, and then they were inside the garage sweeping towards a distant door.

The car stopped. Without a word, Craig obeyed the pistols that motioned him out. He was led along a deserted corridor towards a freight elevator.

The elevator halted at the third floor. Surrounded by his all-women guard, Craig was herded slantwise across the gleaming corridor, and through a door.

The room was large and lovely, and magnificently furnished. At the far end, on a chesterfield, his back to an enormous window, sat a fine-looking, gray-haired man. To the man's right, at a desk, sat a young woman.

Craig scarcely glanced at the latter. Wide-eyed, he watched as the youthful leader of his guards approached the gray-haired man and said:

"As you requested, President Dayles, we have brought you Mr. Lesley Craig."

It was the name, so blandly spoken out loud, that confirmed the identification. Incredulous, he had already recognized the much-photographed face.

There was no further room for doubt. Here was Jefferson Dayles, President of the United States.

Anger gone, Craig stared at the great man. He was aware of the—females—who had escorted him, leaving the room. Their departure pointed up the strangeness of this forced interview.

He waited, puzzled.

The man, he saw, was studying him narrowly; and after a little Craig noticed that, except for the gray eyes that glowed like ash-colored pearls, President Dayles

looked his publicized age of fifty-nine.

Some newspaper photographs had suggested a youthful, unlined face. But it was clear, gazing at him from this short distance, that the strain of this second campaign was taking its toll of the man's life force.

Nevertheless, it was unmistakably a strong, commanding, handsome countenance, with a serenity of assurance. His voice, when he spoke, had all the glowing, resonant power that had contributed so much to his great success. He said with the faintest of sardonic smiles.

"What do you think of my amazons?" His laughter rolled Homerically through the room; and it was obvious that he expected no answer, for his amusement ended abruptly and he went on without pause:

"A very curious manifestation, these women. And, I think, a typically American manifestation at that. Once taken, the drug cannot be counteracted; and I regard it as an evidence of the basic will-to-adventure of American girls that some thousands took the treatment.

"Unfortunately, it brought them to a dead end, left them futureless. Unequalized women dislike them, and men think they're 'funny' to use a colloquialism. Their existence did serve the purpose of galvanizing the women's clubs into undertaking a presidential campaign. But as individuals the amazons discovered that no employer would hire them, and no man would marry them.

"In desperation, their leaders approached me; and just before the situation reached the tragic stage, I arranged a skillful preliminary publicity, and hired them *en masse* for what is generally believed to be perfectly legitimate purposes.

"Actually, these women know their benefactor, and regard themselves as peculiarly my personal agents."

Jefferson Dayles paused blandly. "I hope, Mr. Craig, that this will explain to some extent the odd method by which you were brought before me. Miss Kay Whitewood" —he motioned to the young woman at the desk—"is their intellectual leader."

Craig did not let his gaze follow the gesturing hand. He stood like a stone, and was almost as blank mentally. He had listened to the brief history of the group of amazons with a fascinated sense of unreality.

For the story explained nothing. *Literally* nothing. It wasn't the means, or the details of how he had been brought here that counted. It was—why?

He saw that the fine eyes were smiling at him in amusement. Jefferson Dayles said quietly:

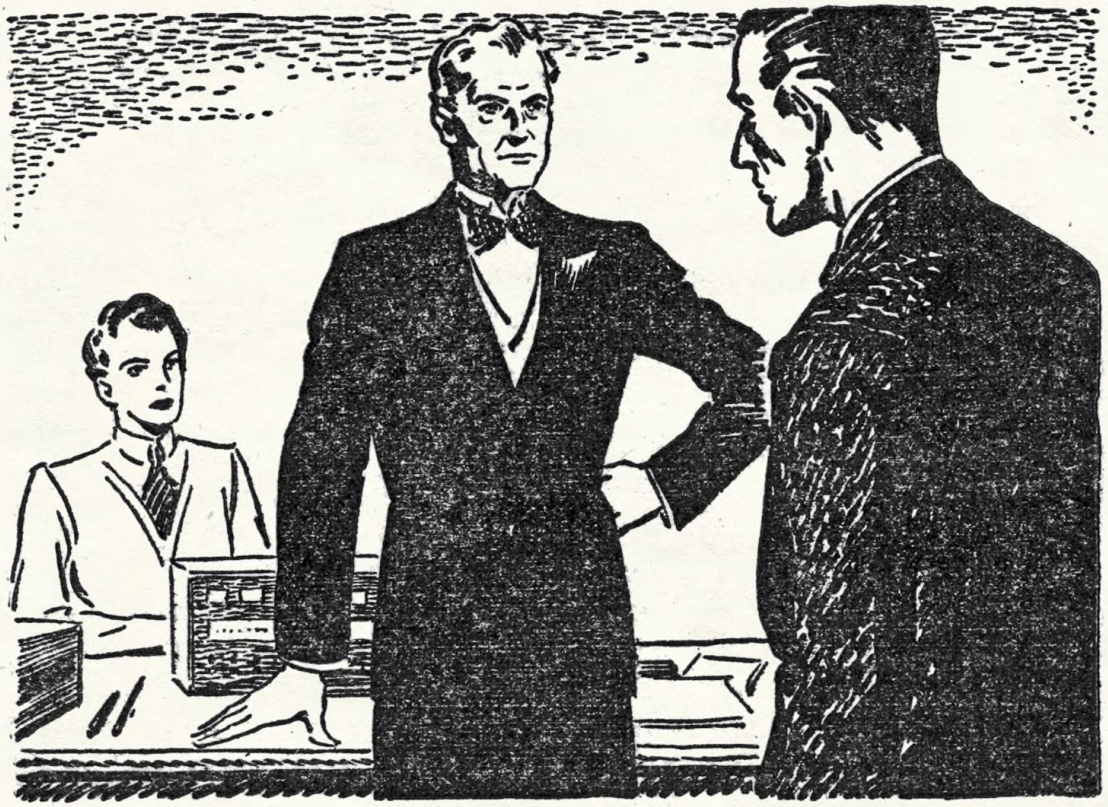
"There is a possibility that you will wish to report what has happened to authorities or newspapers. Kay, give Mr. Craig the news item we have prepared to meet such an eventuality."

The young woman rose from the desk, and came around it towards Craig. Standing up, she looked older. She had blue eyes, and a very hard, pretty face. She handed

Craig a sheet with typewritten lines on it. He read:

Big Town—July 9, 1972—An irritating incident disturbed the motor drive from Dayles than he could, well, ride up Main Street firing a six-shooter.

Mentally, he pictured the shouting headlines:



Middle City of President Jefferson Dayles. What seemed like an attempt to ram the car of President Dayles on the part of a young man in an electric automobile was frustrated by the prompt action of his guards. The young man was taken into custody, and later brought to the presidential hotel suite for questioning. His explanations were considered satisfactory. Accordingly, at President Dayles' request, no charges were made, and he was released.

After a moment, Craig allowed himself a curt laugh. This doctored news item was, of course, final. He could no more engage in a newspaper duel with Jefferson

Obscure Business Man Accuses Jefferson Dayles

Smear Campaign Against the President

Craig laughed again, more sardonically this time. There was no doubt about it. Whatever Jefferson Dayles reason for having him kidnaped—

His mind stopped there. Whatever his reason! What *could* be his reason? In a blaze of bewilderment he shook his head. He could contain himself no longer. His

wondering gaze fixed on the gray, half-amused eyes of the executive:

"All this," he marveled, "so much effort expended, such a dishonorable story deliberately prepared—for what?"

It seemed to him then, as he stared at the other, that the interview was about to get down to business.

The older man cleared his throat, said:

"Mr. Craig, can you name the major inventions perfected since the end of World War II?"

He stopped. Craig waited for him to go on. But the silence lengthened, and the president continued to look at him patiently. Craig thought, startled: It was a genuine question, not just rhetoric.

Craig shook himself, said finally: "Well, there hasn't been much. Of course, I'm not up on these things, but I would say the rocket to the moon, and a few developments of the radio tube and—"

He broke off blankly: "But see here, what is all this? What—"

The firm voice caught at one of his sentences. "There hasn't been much, you say. That statement, Mr. Craig, is the most tragic commentary imaginable on the state of our world. There-hasn't-been-much. You mention rockets. Man, we don't dare tell the world that the rocket, except for minor details, was perfected during the war, and that it's taken us thirty years to solve those minor details."

He had leaned forward, in the intensity of his argument. Now, he sank back with a sigh.

"Mr. Craig, some people say that the cause of this incredible stagnation of the human mind is the direct result of the compromise peace we accepted to end World War II. That, I think, is partly to blame. A bad moral atmosphere tires the mind in a curious sustained fashion; it is hard to describe. It is as if the brain wears itself out fighting its intellectual environment."

He paused, and sat there, his face dark with thought, as if he was searching for a more definitive description. Craig had time to think in a stark amazement: What was all this? Why was *he* being given this intimate detailed argument?

The executive was looking up. He seemed to be unaware that he had paused. He went on:

"But that is only part of the reason. You mentioned a little while ago radio tubes."

He repeated in an oddly helpless voice: "Radio tubes!" He smiled wearily. "Mr. Craig, one of my degrees is a B.Sc., and that has made me preternaturally aware of the tremendous problem confronting modern technology, the problem of the impossibility of one man learning all there is to know about one science.

"But to get back to radio tubes—it is not generally known that for several years a number of famous laboratories have been picking up weak radio signals which are believed to originate on Mars.

"Six months ago, I determined to find out why no progress was being made towards amplifying

these signals. I invited three of the greatest men in their special radio fields to explain to me what was wrong.

"One of these men designs tubes, another circuits, the third man tries to make the finished article out of the other's separate jobs. The trouble is this: tubes are a lifetime study. The tube designer cannot but be hazy on circuits because that, too, is a lifetime study. The circuit man has to take the tubes he can get, because, having only a theoretical knowledge of tubes, he cannot specify or even imagine what a tube should do in order to fulfill the purpose he has in mind.

"Among them, those three men have the knowledge to construct new and startlingly powerful radios. But over and over and over again they fail. They cannot conjoin their knowledges. They—"

He must have become aware of the expression on Craig's face; for he stopped, with a faint smile.

"Are you following me, Mr. Craig?"

Craig bowed before the ironical twist in the other's smile. The long monologue had given him time to gather his mind. He said:

"The picture I'm visualizing is this: A small business man forcibly picked up on the street and brought before the president of the United States. The president immediately launches into a lecture on radio tubes. Sir, it doesn't make sense. What do you want from me?"

The answer came slowly: "For one thing, I wanted to have a look at you; for another—" Jefferson Dayles paused; then: "What is your blood type, Mr. Craig?"

"Why, I—" Craig caught himself, and stared at him. "MY WHAT?" he said.

"I want a sample of your blood."

Craig could only gaze at the man helplessly. But he seemed not to be aware.

"Kay," he said, "obtain the sample, will you? I'm sure Mr. Craig will not resist."

Craig didn't. He allowed his hand to be taken. The needle jabbed his thumb, bringing a faint "ting" of pain. He watched curiously as the red blood flowed up the narrow tube of the needle.

"That's all. Good-by, Mr. Craig. It was pleasant meeting you. Kay, will you please call Mabel and have her return Mr. Craig to his office."

Mabel apparently was the name of the leader of his escort; for it was she who came into the room, followed by the gunwomen. In a minute Craig was out in the hall, and in the elevator.

After Craig had gone, the great man sat with a fixed smile on his face. He looked once over at the woman, but she was staring down at her desk. Slowly, Jefferson Dayles turned, and stared at a screen that stood in the corner near the window behind him. He said quietly:

"All right, Mr. Nypers, you can come out."

Nypers must have been waiting for the signal. Because he appeared even before the words were com-

pleted, and walked briskly over to the chair the president indicated.

Jefferson Dayles waited until the old man's fingers lay idly on the ornamental metallic knobs of the chair arms; then softly:

"Mr. Nypers, you swear that what you have told us is the truth?"

"Every word." The old man spoke energetically. "Lesley Craig, though he has no knowledge of the fact, is due once more to enter his toti-potent stage. I came to you because you're his blood type AB, or group IV by Jansky nomenclature. That is your blood type, is it not?"

Jefferson Dayles sat very still. His impulses was to close his eyes against brightness. But the brightness was in his brain, not outside; and he had the shaky conviction that it could burn out his mind if he was not careful.

At last he managed to turn to Kay. Relieved, he saw that she was looking up from the lie detector register on her desk. The detector that was connected to the ornamental knobs on the arm of the chair in which Nypers sat.

As he looked at her, Kay nodded ever so slightly.

Jefferson Dayles froze. The brightness was like a white fire; and he had to fight, to sit there rigid, straining with his brain against the unnamable joy that was tearing at his reason.

The desire came to rush over to Kay's desk and himself glare down at the lie detector register and compel Nypers to repeat his words. But that, too, he fought off. He grew aware that Nypers was speaking again:

"Any further questions before I leave?"

"Yes." It was Kay. "What I'd like to know is, why are you doing this?"

The old man hesitated, then sighed. "I am not prepared to answer that. The reasons for a betrayal do not always sound nice when brought out into the open."

Kay's flinty blue eyes flashed. "We are unshockable; I assure."

Nypers shrugged. "Proceed to your next question, please."

"You won't answer?"

"You have my reply."

There was silence. Jefferson Dayles saw that Kay was trying to catch his eye. He ignored the attempt. It was strange, but he felt no interest. The main fact was verified; the lie detector had proved all that was necessary.

He thought: Was it possible that this was so big a thing for him personally that he had already lost all objectivity in connection with it?

Even the question in his own mind did not rouse him. He listened quietly, as Kay said venomously:

"We could force an answer, Mr. Nypers."

The old man rose slowly to his feet. He had, Jefferson Dayles saw, an odd expression on his face.

"Don't you think," he said, "that President Dayles' political situation is precarious enough without any dramatic developments?"

"What do you mean?"

It was a bad question for Kay to have asked, Jefferson Dayles realized. Nypers smiled, and said softly:

"There are people who maintain that the United States twenty-five years ago suffered a moral disaster when she accepted the compromise peace that ended World War II. A president with dictatorial ambitions opposed by a woman candidate may or may not be a proof of that."

His smile deepened into a sneer: "The real proof will be the next election. How many ballots boxes is it you have decided to stuff to insure President Dayles' re-election?

"Wait!" His voice rose in pitch. "I expect you to refrain from torturing or threatening me, and to look after me according to our agreement. I expect it because I have prepared a very interesting account of this whole matter, which will come to light if anything should happen to me."

He bowed, finished in a quieter voice: "I am sorry to have to be so blunt, but it is well to clarify the situation. And now, if you have no further objections, I shall depart."

This time Jefferson Dayles allowed Kay to catch his eye. He nodded, with a twisted smile. "Let him go, Kay."

At the door, Kay said to Nypers: "This toti-potent phase of Craig—what is he like when he is in it?"

"His condition varies," was the cool reply. "But"—Nypers showed gleaming white teeth—"I would not be here if he was dangerous."

"Which," said Kay savagely, after the door had closed behind Nypers, "means exactly nothing. He's holding back vital information. I'll wager the group behind him know he came here. I'll even go so far as to say that they sent him. What's their game?"

Her eyes narrowed to calculating slits. Several times she seemed on the verge of speaking, but each time cut her words off.

Jefferson Dayles watched the interplay of emotions on the intensely alive face, briefly absorbed by this curious woman who felt everything so violently. Finally, he shook his head; his voice was strong as he said:

"Kay, it doesn't matter. Don't you see that? Their game, as you call it, means nothing. No one, no individual, no group, can stand up against the commander in chief of the United States Army, Navy and Air Force."

He drew a deep, slow breath. "Don't you realize, Kay, that the world is ours?"

II.

He sat in a restaurant, eating. His hands with the fork and knife in them, or a piece of bread, or a cup, moved up and down, like synchronized robot attachments of his body. The food touched his lips, and there was an occasional thrill of taste pleasure.

The two events of the morning seesawed in Craig's mind, each in turn struggling for his attention, gaining it, then yielding to the other.

Gradually, the episode of Jefferson Dayles began to lose fascination.

Because it meant nothing. Literally. It was like an accident happening to a man crossing a street, having no connection with the normal continuity of his life, and quickly forgotten once the shock and the pain were ended.

The rest, the problem of what had happened four years before, was different. It was still a part of his mind and his body. It was *of* him, not to be dismissed by the casual assumption that somebody must be crazy.

The situation was: he had been heading home with the intention of obtaining explanations—when the accident of Jefferson Dayles had interrupted.

Craig glanced at his wrist watch. It showed ten minutes to one.

He pushed away the dessert, and stood up. There was still time to go and question Anrella. But first, back to the office. He went as far as the information desk:

"Tell Mr. Nypers, when he comes in, that I'll be later than usual."

The girl answered brightly: "Mr. Nypers said he wouldn't be back before three, Mr. Craig."

"Very well, then, tell Mr. Carson."

His mind persisted in remaining blank during the trip. It was as he turned his electric automobile through the massive iron gates, and saw the mansion, that a new realization struck:

The house! It had been there too, four years ago.

An amazingly expensive place it was, with an outdoor swimming pool and landscaped grounds that he had got, according to his memory at the bargain price of ninety thousand dollars.

It had not occurred to him before to wonder how he had saved ninety thousand dollars to pay for the house. The sum had somehow seemed within his means.

The residence grew from the ground. The architect must have been an earnest disciple of Frank Lloyd Wright, for the skyline blended with the trees and the land. There were sturdy chimneys, outjutting wings that merged coherently with the central structure and a generous use of casement windows.

Anrella had always looked after the accounts from their joint bank control. The arrangement left him free to devote his spare time to his lust for reading, his occasional golf, his fishing and hunting trips, his private airfield with its electric plane. And, of course, it left him free for his job.

It failed, however, to provide him with any real idea of where he stood financially.

Again, and stronger now, came awareness of how odd it was that he had never worried, or wondered, about the arrangement.

He parked the car and walked into the house, thinking:

"I'm a perfectly normal well-to-do business man who's run up against something that doesn't quite fit. I'm sane. I have nothing to win or lose physically by a

single inquiry. My life is ahead of, not behind me."

It wouldn't, he told himself forcibly, matter one iota whether he ever learned anything. The past didn't count in any way. He could live the rest of his life with scarcely more than a twinge of curiosity—Where the devil was Nickson?

Hat in hand, he stood in the great hallway, waiting for the butler to acknowledge by his presence the sound of the door opening.

But no one came. Silence lay over the great house.

Pressing buttons did no good. Craig tossed his hat onto a hall seat, peered into the deserted living room, and then headed for the kitchen.

"Sybil," he began irritably, "I want—"

He stopped. The reverberations of his voice echoed back at him from an empty kitchen. Nor was there any sign in the storeroom of the cook and the two pretty kitchen maids.

A few minutes later, Craig was climbing the main staircase when a sound of murmuring voices touched his ears.

The sound came from the upstairs drawing room. His hand was on the knob, when a spasmodic silence inside was broken by the clear voice of Anrella saying:

"Really, the argument is quite useless. The time for the change has come, and it's too late now to alter our plans. Objections should have been made at the last meeting because . . . tell them what you did this morning, Mr. Nypers."

Nypers! The shock almost burned Craig, as it struck into his brain. The old man's dry voice came then, confirmingly:

"I have done everything I was commissioned to do at our last meeting. Unsettling Mr. Craig was simple enough, but the interview with President Dayles involved, as we suspected, a careful phrasing of answers to counteract a lie detector. I think I put it over, although I have no doubt they are suspicious of us all.

"I'm sorry I didn't know there would be objections. But I sincerely think delay would not have been wise. The time to inform the president was while he was here on the spot, able to have Mr. Craig brought before him."

There was silence; then somebody said: "If it's done, it's done."

There followed a jumble of voices, of discussion, from which only occasional words emerged clearly: ". . . His great stage . . . the final chance . . . necessary to subject him to breaking pressures . . . think his way out of that . . . no limit—"

Though the words made no joint sense, Craig recognized some of the voices: Peter Yerd, one of the millionaire customers of the Nesbitt Co., Nesbitt himself, a multimillionaire named Shore, Sybil the cook and—

Afterwards Craig cursed himself for leaving at that point. But he couldn't help it. Fear came like a blinding stab of darkness, the fear that he would be discovered here,

now, before he could think this thing out.

He slipped down the stairs like a ghost, snatched his hat— As he emerged into the open, he saw for the first time the half dozen cars parked at the far side of the house. He'd been too intent on himself to notice them when he came in.

The electric automobile started with a faint hum—thank Heaven the upstairs drawing room was on the other side of the mansion—and a few minutes later he was guiding the machine through the iron gates, and along the old farmer's road to the city highway.

He had a very strong conviction that it was going to be an afternoon of mental turmoil.

The attendant of the building's parking lot said to Craig that night:

"A mechanic, a man named Gregory, came to work on your car this afternoon, Mr. Craig. I hope it was all right."

"Oh, yes, yes," Craig replied absently.

He walked on, and climbed into his machine. As he drove off, his mind drew free of the welter of thoughts that were in it, and focused on the attendant's words.

After a moment, there was still nothing to think about them. If Jim Gregory had decided the car needed attendance, then it did.

Click! said the car fifteen minutes later. The low, sustained humming of the engine changed its tune; the machine slowed and coasted to a halt.

Craig frowned at the instrument board. Then he fingered the main switch. It was in, registering contact. He pressed the accelerator again.

There was no response. Craig shook his head. This was the first time this had ever happened. After Gregory had gone over the engine too.

He thought about that a little harder; and slowly a chill crept over him. He sat, then, remembering that Gregory was one of them.

This car stalling here was no accident.

Uneasily, Craig examined his environment. He had left the highway ten minutes before, and was now in the tree-sheltered valley beyond One-mile Hill. The outskirts of the city were about eight miles behind him, the city itself no longer visible.

He was roughly five miles from home, and about a mile from the nearest farmhouse.

It must have been done with a purpose. Perhaps he was expected to do something.

He climbed down into the road, and then stood indecisive. Because actually, he knew nothing about electric motors. Or any other kind of motor. Nevertheless—

With a quick movement, Craig lifted the hood. He stood then, nonplussed, studying the long, narrow, streamlined shape that was under it.

There were no visible wires, and no electric motor, simply that gray metal tube about a foot and a half in diameter.

Craig reached down gingerly and touched the metal. Instantly, he jerked his hand back—but forced it down again, touched the metal, even more swiftly this time.

And there was no doubt. The metal was cold, *cold*. Unnaturally, icily cold! Freezingly, deathly cold.

Craig put down the hood, and stood there on that quiet road, stood very still and very tense. But it was only after a long blankness that realization came:

This was it. This was what they had wanted him to find out. Nypers had given him the first hint of wrongness. This was supposed to be the second.

Actually, of course, he had already overheard, and guessed, much. But they didn't know that.

For years he had believed his car had an electric motor powering it; and now they wanted him to know that the motor wasn't electric at all. That instead it was—

What?

Gregory picked him up at the farmhouse about fifteen minutes after Craig phoned. He was a big, powerfully built young man with a placid face. He said easily:

"I could have sworn there was something wrong with that car when you left this morning, Mr. Craig. Ran into town special to have a look at it, but couldn't find nothing. Guess I'll have to unwind the armature."

Craig muttered something about leaving all that to you, Jim. He was silent on the way home. Silent and shocked and uncertain.

It was one thing to think, as he had earlier, that Jim was a member of the gang. It was another to watch him drive up in the replica of the stalled car, and listen to his cheerful lying. To *see* him face to face, and *listen* to him lying.

The bitterness faded slowly before a thought that he had deliberately buried deep, but which now inexorably rose to the surface: the engine!

The engine didn't fit. It had no more meaning than the action of Jefferson Dayles in having him kidnaped.

Craig found himself listening tautly to the humming sound of the motor. He had always taken for granted that the vague throb was that of an electric engine.

It *was* similar. But it seemed to him suddenly that it was throatier.

Could it be compressed air?

But then why had they lied to him? He who knew nothing about either motive force would have accepted an air-pressure engine explanation with the same credulity that he had accepted the statement that the power was electric.

It would be different if the engine was something marvelous. But it wasn't. It drove a plane at a cruising speed of ninety-five miles an hour and a car at a top speed of sixty.

Inwardly, Craig groaned. The wretched thing about it all was: how was he expected to react? For some reason or other, they had not expected him to be so troubled that he would drive home for lunch.

As a result he knew more than they realized. It was going to be difficult under such circumstances to know what to say, even to Anrella.

Should he be bold? Cautious? Demanding? Secretive?

It was a problem.

The kiss was sweet and prolonged. Her mouth was warm, her manner ardent. Her fingers brushed his cheeks in a caressing gesture, as she finally half-released him, half-withdrew from his responsive embrace.

It was briefly hard to remember that he had heard her say in a resonant, resolute voice—what she had said to the people gathered in the drawing room that noon.

Anrella stared at him now, and spoke:

"You look tired, darling. Come into the living room and lie down. I'm sorry you had the trouble with the car. I shall have to speak sharply to Gregory."

He watched her from the couch with appraising eyes. And a little shock pierced him as he realized that she looked quite capable of speaking sharply to Gregory. Or to anybody else for that matter.

She had eyes of deep blue, and a figure that was tall and, well, svelte. She was easy on the eyes, this wife of his; and it wasn't that she looked cruel. She merely looked—mature. Tremendously mature for one physically so young.

It was the kind of maturity you might expect from a matron of fifty. Young women were usually very careful of the way they exercised authority. Maids, gardeners, clerks, male or female, had a habit of quitting if a thirty-year-old woman was too bossy.

Anrella somehow carried it off. None of her help had ever quit for any reason. That was, quit for good. They simply took long holidays, and, suddenly, there they were again, looking tanned and healthy, as if they had been at Palm Beach, or Miami, or somewhere.

Craig paused on the idle thought, shocked: *Could* they have been to Palm Beach?

He shook himself impatiently, but his almost closed eyes widened a little. He watched Anrella where she sat in a nearby chair glancing through the evening paper he had brought.

Palm Beach was impossible, of course. But where did they go?

It was an angle that might be worth investigating. And there were other things. For instance, what wages did Anrella pay? In an outfit that included millionaires like Yerd but also Sybil the cook, and Gregory, it was just as well to gather a few facts before mentioning anything.

He didn't know enough. He—didn't—know!

He watched Anrella from slitted eyes. How sleek she was, how beautifully dressed. She was like that mentally, too; always hers had been a richly garbed mind, swift in response and in a curious, hard yet intensely human and humane logic.

Whatever else happened, he must draw her safely clear.

If only he had the courage to question her. But, no!—decisively though imperceptibly Craig shook his head—not now. Wait! There would be time enough after he had a more solid base of information.

Somehow, she had got entangled into a powerful organization, and the will to help her would never be enough. Not the will of a man who hadn't the faintest real idea what his own past history was.

He must never forget that that tremendous gap in his mind must come first. Astonishing as his other discoveries had been, they were yet not so astonishing as the false past that had somehow been impressed on his brain.

He had to live with his mind. So long as it remained partially blank, his life would be an empty shell.

They knew, of course, that he knew something. Let them. Let them wonder how he was taking it, what he was doing and thinking. If he showed no sign, they would become puzzled, and wonder if perhaps he had not missed their cues.

Further action on their part would then be inevitable. By playing dumb, but not too dumb, he might reach the point where he knew enough to act. The point, for instance, where he knew exactly how Jefferson Dayles fitted into the picture.

Somehow, all this was connected.

It wasn't fear; Jefferson Dayles knew that. But he had to have, for the sake of his nerves and his conscience, *had* to have Craig safe.

This council of war had no other purpose. But for a while Jefferson Dayles temporized. He emphasized to the women, as he had in a previous meeting, that his re-election chances were dimming every hour.

As he stared out over the small pond of hard, bright, alarmed faces, he felt anew the close-knittedness of his relationship with these leaders of America's equalized women.

They were his, body and soul, almost like personal possessions, or extensions of his own physique—his private army, in a world where, since Hitler, there had been a law barring from politics anybody who gathered such a force around him.

But no one suspected how completely they were his creatures. Not even his political opponents, who after careful prodding, announced acidly through the medium of Mrs. Janet Wake herself, that they would certainly not tolerate equalized women in the government service "if I am elected president."

His speech to them now was a preliminary, a building up to his main theme: Craig. He said:

"We are living in a curious age, an age where people jump this way, that way, without thought. Right now they are in the throes of an ecstatic will to give women equality by electing Janet Wake as the first woman president.

"It is an unreasoned determination because it is basically at odds with reality. If women as a body were prepared to take the equalizer drug, and if men could get over their instinctive dislike of women who have taken it, the problem might be resolved.

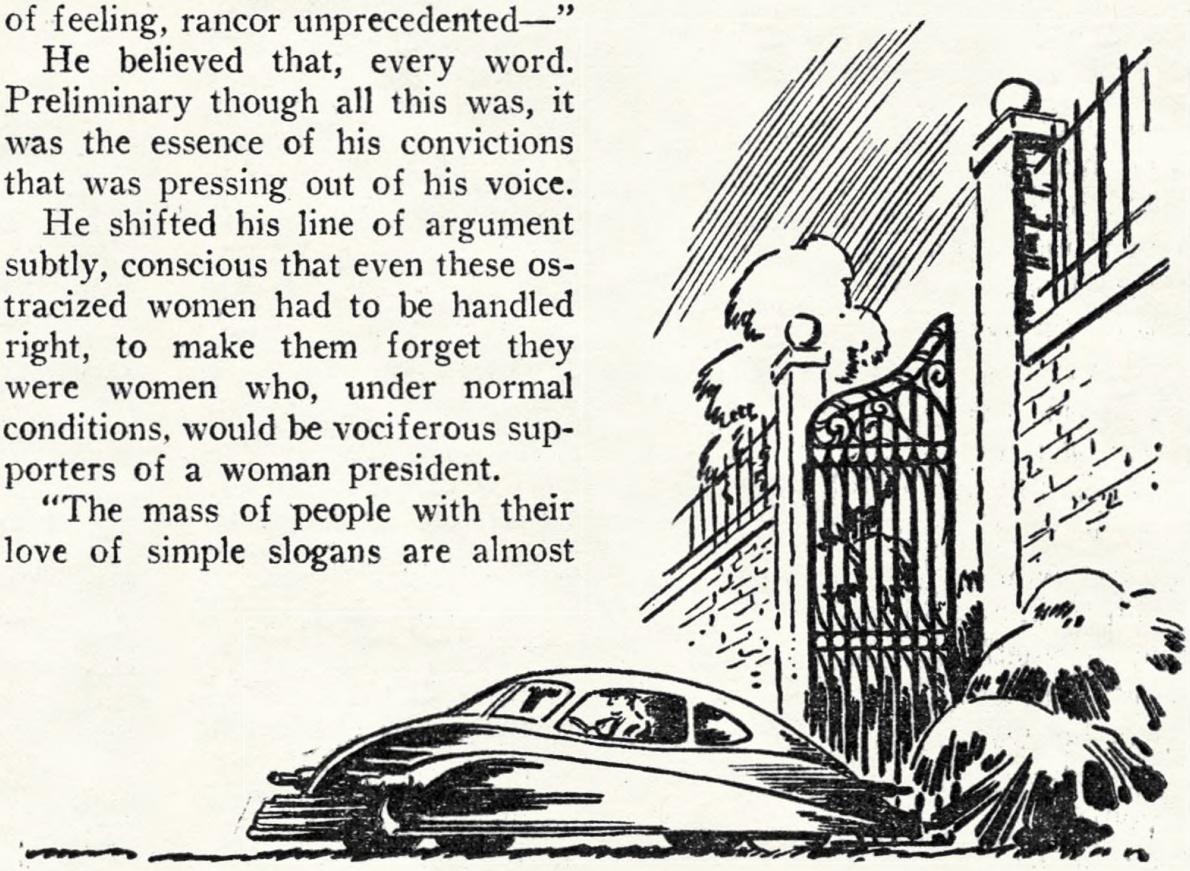
"But as you equalized women know from your personal experience, women are your worst enemies and men won't have anything to do with you. If normal women start running this country after a successful election, there would be chaos and riots, immense revulsions of feeling, rancor unprecedented—"

He believed that, every word. Preliminary though all this was, it was the essence of his convictions that was pressing out of his voice.

He shifted his line of argument subtly, conscious that even these ostracized women had to be handled right, to make them forget they were women who, under normal conditions, would be vociferous supporters of a woman president.

"The mass of people with their love of simple slogans are almost completely unaware that almost the only reason why democracy is a good system is because it provides opportunities to eliminate bad and tyrannical governments. Democracy enables the people to knock out of office the most flagrant of two or more power grasping groups, thus exercising a wholesome restraint over their lusts.

"Actually, a benevolent dictatorship is the best form of government. The danger, the immense, deadly and, in the past, unavoidable danger has been that sooner or later the good dictator has died, to be succeeded by a bloody, stupid tyrant with schemes for war and personal aggrandizement.



"I shall be a benevolent immortal dictator—"

Dayles believed that, too, the benevolent part. For years and years he had been in spite of all his friends and colleagues, alone in the world. He had made the mistake in 1944 of taking Alice and the boys to London; and one bomb had blotted them from his life. It was all vague now; it was hard in these days to think with any sense

of reality of the young woman who had been his wife.

For nearly thirty years he had watched the changing shape of a badly mauled world, had watched science stagger blindly to a halt, shackled by the mortality of the poor, miserable human beings who learned just so much, then sank into their bottomless graves, taking their knowledge with them.

The blood of Lesley Craig, carefully allotted, would end all that. He knew what must be done, what could be done. Sometimes he admitted wryly that power was sweet in itself, and life precious. But actually he felt selfless.

He said: "In view of the necessity for ballot box stuffing on such a large scale, I have come to the conclusion that only the certainty of success would make it all justifiable. We must have Craig now, not as we originally planned, after the election.

"It's risky; it will be personally dangerous for all of us. Discovery would ruin my re-election chances, and end our hopes. Nevertheless, there is no evading the issues. A dictator must convince the citizens of the country he rules that he is wonderful, unique, supra-normal.

"What greater wonder than if, at the end of my second term, the Hand of God seems to reach down and slough thirty years from my age.

"It will seem a blessing from heaven itself. The religious fervor that will sweep the land will jump the oceans and win us the whole world. I shall, if we plan well, automatically be accepted as the permanent president of the United States.

"But we must have the man who can make that possible. Even though it is months yet to the election, we must have Craig. I want arrangements made to insure his capture within a month—"

Afterwards, just before bedtime, he spoke briefly, privately, to Kay.

"Did you tell them what I asked you to?"

She nodded a little stiffly. "I don't think they have much hope. They can see all right that Craig can, during one thirty-year-period, rejuvenate about three hundred people. But they don't quite believe that any amouut of scientific manipulation can benefit people who are not of his blood type."

Jefferson Dayles hesitated; then: "Suppose it couldn't be done, what would you think personally?"

"There's nothing to think about it," was the harsh reply. "I'm not his or your blood type, whether they call it AB, Moss 1 or Jansky IV, and that's all there is to it. Besides—"

"Yes?" He spoke softly.

"I'm only thirty-four. When I get older, I may start cursing fate. I don't think about it very often."

There was silence, then: "Good night, Kay."

"Good night."

III.

The days ran their swift course, and life went on. Every morning except Sunday, Craig climbed into

his—not electric—runabout, and drove to work. Every evening except Sunday—and Saturday, when he left at one—he drove back again to the great house inside the iron fence.

It required a real effort of will not to change his hours or his route. Particularly his route. The more he thought about the way his car had stalled on that lonely farmer's road in dense bush country a mile from the nearest farm, the more desirable the highway through Alcina seemed.

But he didn't dare change to it. It would be noticed. They'd know then that he had seen the engine.

Craig waited tensely for their reaction to his nonreaction. But nothing happened.

On the seventh morning, the letter arrived containing his birth certificate. Craig read it with satisfaction and, he admitted it frankly to himself, relief.

There it was in black and white: "Lesley Somers Craig. Born June 1, 1922, town of Daren, county of . Father: John Laidlaw Craig. Mother: Grace Rosemary Somers—"

He had been born. His memory had not played him false. The world was not completely upside down. There was a gap in his memory, not an abyss. His position had been that of someone balancing on one foot beside a chasm of unmeasurable immensity. Now he was like a man standing legs spread apart straddling a narrow though deep pit.

It was true the pit had to be filled in, but even if it wasn't, he could walk on without the horrible sensation of tottering in pitch darkness along the edge of a cliff.

A sharp weakness seized Craig as he sat there. He swayed, recovered himself, then lay back heavily against the back of the chair. The astounded thought came: "Why, I'm on the point of fainting."

The nausea went away. Carefully, Craig climbed to his feet, and filled a glass with water. Back in his chair, he raised the glass to his lips—and saw that his hand was trembling.

It shook him. He had, he realized seriously, really let this business get him going. Thank God, the worst of the purely personal part was over; not entirely over, it was true. But at least he had his beginning established. As soon as his military record arrived he'd be solidly based up to the age of twenty-four.

A pretty sound base if you really thought it over. And since his conscious life had resumed at the age of forty-six, that left exactly twenty-two years to be accounted for. It—

The high confidence drained. Like a settling stone, Craig crouched in his chair.

Twenty-two years! His real lifetime. Growing up didn't count. That was the animal stage, a sort of enormously prolonged marking time, the preliminary to the main event.

Twenty-two years! Oh, God!—

His military record arrived on the afternoon of the ninth day. It

was one of those printed forms, where the answers are typed in blank spaces provided.

There was his name, his age . . . regiment . . . pre-war occupation —"Clerk." Well, that fitted. There was the name of his next of kin, medals—"None." Serious wounds or injuries: "Amputation of right leg necessitated by injury in fighter plane crash—"

Craig stared. But he still had his right leg, he thought with an owllike gravity.

The gravity broke like a bomb-shattered dam; and again he stared at the unchanging print. At last he thought: There must be a mistake. Some fool up in the records office typed the wrong—

Even as one part of his brain developed that argument, another part accepted everything, accepted and knew that there was no mistake, that there was nothing wrong with this form.

The wrongness, the mistake, was not out there in some government department. It was here in him.

He should have known the very instant that he tried to convince himself that he, with his thirty-four-year-old body, was fifty. He had known. The knowledge had been there in his mind like a sick thing fighting against the greatest force in the human ego: the will to have a positive identity. There was no fooling any more.

He was not, never had been, Lesley Craig.

Accordingly, the time had come to confront those who knew who he was. Whatever their purpose in impressing upon him the belief that he was Lesley Craig, it must now be forced out into the open. *Now!*

It was four o'clock by his wrist watch, as he turned through the open twenty-foot high gate, and guided his car along the driveway, in and out among the trees.

He drove the machine into the garage. Gregory was there. Gregory said:

"Home early, Mr. Craig."

"Yep!" said Craig.

He walked out through the side door, and along the walk that led to the French windows. He was as calm, he thought, as he'd ever been. There was no reason to be otherwise. He knew exactly what he was going to say and what he wasn't.

No side issues. Just his own mental problem, his discovery of the gap in his memory, and the fact that he wasn't Lesley Craig.

The rest, the curious rest, didn't matter now. He could go into that later. Now, there was only himself.

Anrella was arranging some flowers in the living room. She turned, said serenely:

"Why, hello, there, Les—home early."

In spite of his calmness, there must have been something in his face. Or perhaps—more likely—with her knowledge, she knew what was coming.

"Les," she said sharply. "What's the matter?"

Craig felt a brief, unexpected

bitterness at the way she was acting it out. Then he said:

"Sit down, Anrella, I've got something to tell you."

He began with Nypers' casual remark. He omitted all suggestion that he knew the remark had not been casual, but deliberate. He made no reference to his return home that first day at lunch time and what he had overheard. Clearly, succinctly, he described his discoveries about his own mind.

When he had finished, Anrella said:

"Oh, you poor darling. Oh, Les, I'm sorry you've found this out."

Craig saw that she was crying. The tears shone like jewels in her eyes, and then, no longer gemlike, trickled down her cheeks damply staining the powder that was there. Her eyes remained big and bright and crying.

"It's really very simple, Les. You had a nervous breakdown, a very bad one involving loss of memory; and the present you is a built up personality, painstakingly built up. You mustn't try to tear down that structure.

"Let it alone, Les. Forget what you've discovered. Just keep things as they are, for my sake and your own."

"But look here—" Craig began.

He left the sentence dangling. Because it could be. He sat stiffly staring at Anrella, fascinated by the explanation.

It did explain, up to a point. His mind must have smashed and scattered like a spark struck from metal. Needing then to be refashioned into a coherent wholeness.

For an instant, Craig had a mental image of what his mind must have been: an amorphous, groping thing, a blurred picture world, a vast—in a special sense of vastness—formless universe of half memories, of badly wrenched threads of personality, a frayed, tattered, incredible monstrosity of a semi-brain.

It was not a pleasant image to behold, but it braced him. It was the not knowing, he thought, the terrible and increasing uncertainty, that had unnerved him during this past week.

Now he knew. The whole thing was resolved down to a simple pattern. He must find out a few more facts, clear his mind of the questions that tormented it—and then forget the whole matter.

He knew he would be able to forget. They had done well, those great doctors who had rebuilt his mind. He felt the strength inside him, the boundless strength of a healthy mind that knew its sanity. Yes, they had done well. The only trouble was—

His sense of easement faded. He shook himself. Just a minute! Just one minute! What about . . . and what about and—

Craig leaned back, laughing inwardly, mirthlessly, at himself. She had nearly got him. But not quite.

He stared at Anrella with hard, bright eyes, speculatively. She was probably not the first wife who had lied to her husband with a straight face.

The realization did not make the reality any easier to take.

She was not looking at him. She had taken out her handkerchief, and sat dabbing at her eyes. She put the handkerchief away finally—and Craig saw that it was time he said something, something that would not give away his disbelief, but which yet would carry on the farce.

If he was careful, he might gain some valuable information.

The moment he spoke, however, he recognized that the grim train of his thought was going to be hard to conceal. His voice was sharp, almost harsh:

"But I'm not Lesley Craig. Lesley Craig is a man fifty years old, who lost a leg in 1944."

She seemed not to notice the strained, unnatural tone of his voice:

"Oh, you fool, Les. Don't you understand? You're a famous medical case. You were found wandering on a roadside without memory, with no knowledge of who you were. You were taken over by doctors of a wealthy foundation, given the identity of a patient who bequeathed his whole property to the foundation while you were there. The reason they gave you an older man's identity was because they wanted you to feel older, to feel more responsible, to feel yourself somebody. I was your nurse, who fell in love with you.

"Several wealthy men, supporters of the foundation, grew interested in your case, and one of them —Mr. Nesbitt—agreed to give you your present job. Now, please don't ask any more questions. I've already told you too much. In fact" —she stood up—"I won't say another word till I've talked to Dr. Bovard."

Craig watched her curiously as she walked over to the fireplace. She stood there, head bent, leaning against one of the ornamental protuberance of the mantel.

It was disturbing that he could appraise her with such detached coolness. But the astonishing thing was that he was not even bothering to examine her story.

It was a plausible story. He had to admit that. It actually covered a lot of points that they didn't know he knew, such as the fact that there were wealthy men like Peter Yerd and John Nesbitt in the background of his problem.

It wasn't even, Craig decided, that Anrella was doing a poor job of acting. She had cried at the right moment, her voice had held all the right inflections, and the moment of getting up and walking off was a beautifully timed bit of business.

In spite of it all, he didn't believe her. Frankly, utterly, finally, he didn't believe a word she had said.

It was hard to put a mental finger on the reasons for his incredulity.

There was what he had heard. About their having to go through with it because of Jefferson Dayles.

Craig grimaced hopelessly. Jefferson Dayles. *There* was a meaningless angle to a figurate that was already approaching the obscurity of

a four-dimensional object.

Beyond question, the story was far from complete. If what she had said was really true, why had they wanted to know. It was the one method calculated to drive him crazy.

Craig felt the change of color in his face. He thought starkly: *Was that it?* For a moment, then, he fought the terrible suspicion. Because Anrella wouldn't. She wouldn't.

Anger came, driving away doubt, flooding, boiling anger that washed caution out of him as if it had never been.

"Why, you incredible scoundrels!" he raged.

He was aware of Anrella turning, staring at him, white-faced. But his rage rode on, gathering force. He shouted:

"I overheard what you said last week, do you understand? I listened in on the meeting that was held here nine days ago."

He had intended going on, stabbing at her with his words. But her reaction canceled that. She leaped to her feet.

"You WHAT?" she said.

Craig was distinctly and amazedly conscious that he had lost the initiative. It was his turn to stare and feel startled. Her face, he saw, was shades whiter under its make-up. Twisted, strained face, distorted eyes.

She came towards him with a curiously graceless walk. Her fingers caught his arm; and, like little stones, pressed into his flesh just above the wrist. She said in a caricature of her normal voice:

"What did you hear? WHAT DID YOU HEAR?"

The wildness of her scared him, shocked him. Craig said uneasily:

"Not much. It was too hard to catch the words. But I heard enough to—"

"But you don't know! You don't know the truth?"

Not a fraction of rage remained in Craig. There was only impatience with her alarm.

"Know what, Anrella!" he snapped. "I assure you, you're in no danger from me."

She seemed not to hear. She let go his arm, and ran in that graceless way for the phone. Craig watched her stupidly as she dialed a number, and listened thunderstruck as she cried:

"Dr. Bovard, come over at once. He heard part of our meeting last week. Yes, yes, he came here to the house—"

She let the phone fall, as if she had forgotten that it had a cradle. On her feet again, she called in a strident voice:

"Nickson—Nickson—Nickson—"

"Yes, yes, madam?" The tall, long-faced butler hurried through the alcove from the hall.

"Call Gregory. Tell him to lock the two gates, and put the gardeners to patrolling."

Crazily, the butler ran for the French windows. As the man rushed by, Craig had the impression that Nickson gave him a cool, appraising look.

He was gone out of the windows. The turmoil was gone with him.

Silence settled. Anrella stood, head drooping, arms limp, near a chair. She looked at the uttermost end of nervous exhaustion. She walked slowly to the chair, and slumped into it. She looked up finally, and said in a flat voice:

"I'm sorry, Les, I'm very, very sorry to have to tell you this. But you can't leave these grounds now until"—she stopped, seemed to brace herself, and went on—"until you're completely cured again."

She finished: "You realize of course that you are quite mad."

So that was to be the angle.

There was no plan. He was alone. The tall sapling growing beside the high fence brought the thought:

Suppose this impossible imprisonment went on and on? Suppose he really wanted to get out of here some day!

Craig started to climb the fence, using the sapling as a brace. Alone, the upper part of the young tree would not have supported him. But by letting the metal poles of the fence carry his weight, and by using the tree as a support only, he reached the top in about three minutes.

The speed of his ascent, the easy strength remaining to him, surprised Craig. It had never occurred to him to assess his physical capacity as anything but "fit."

It was more than that. He hadn't really needed the tree at all.

He balanced himself above the spears of the fence top—and looked around him.

The fence ran along for about a quarter of a mile in either direction. In the distance beyond a wooded meadowland, he could see the church steeples of the three Alcina churches. Half a dozen planes were circling beyond the town, as if they were searching for something.

Trees hid the mansion behind him, and the main gate to the left was barely visible beyond a wavering hedge of mountain ash.

He was alone, briefly his own master. He could leave now, climb or jump down the outer side of the fence, head due west and cross the stream that meandered there, and by that roundabout course cross the countryside towards Alcina.

The savings bank would still be open. He had a small account there, that he had started on impulse one day, when he found himself without funds. He had simply written a cheque on his city bank, deposited it—and never been near the place since.

They couldn't possibly know about an action like that.

He could leave all right. Where to? Well, there was a train due in about forty-five minutes that would take him to New York.

Craig laughed softly, but with bitterness. It was not as easy as that. Physically, perhaps, but not spiritually. A man with his impulses, his instincts, didn't just shoot off to some remote point, and begin life over again.

Damn it all, he was a settled man. He felt settled. Up to a month ago, he had been a happily married business executive, so content with his

way of life that even the thought of change had never touched his mind.

There was another thing to remember: Leaving now would seriously diminish his chances of finding out who he was, and what all this was about.

They were waiting for something, or somebody. Craig stiffened with the memory of his analysis of the way, the expectant way they were waiting. Almost every day the moneyed men—Yerd and Nesbitt and Basil Shore and the others—came up, either by train to Alcina or by car; and they would sit around then talking in low tones, that ended only when he came into the room, when they became jovial and friendly.

But the overshadowing, almost exciting air of waiting for something to happen remained like a miasm of dark hopes.

He must wait, too, for his own sake. He must know—for his own sake. Besides, there was Anrella!

Clinging with tiring muscles to the metal fence, Craig thought grimly about Anrella.

Except for the one astonishing outburst that day he had confronted her—three weeks ago now—she had tried very hard to get their relationship back on its old footing.

She had come up behind him one day as he was reading, leaned over, and kissed him. He had scowled at her. She must have considered it a mild reproof. For that night she came to his room. How she cried when he put her out.

In the morning he found her sleeping on the rug outside his door.

No doubt of it, there *was* Anrella.

The shaky conviction came to Craig that if she came again, he wouldn't send her away.

After a moment, he glanced wryly along the fence he had climbed. Might as well get down and go back to the house, take another one of the sun baths his body seemed to be craving these days. A man who was having his kind of thoughts wasn't leaving. Not yet.

As he twisted himself gingerly into position for the descent, the planes that had been remote points of thunder, swooped down over his head and skimmed the trees inside the fence.

Craig craned his neck, and stared in amazement as they disappeared in the direction of his private landing field. The clattering engines took on the unmistakable, subdued throb of machines in the act of landing.

There was the fading-into-silence sound of slowing propellors, then a rattle of smaller engines: Jeeps, Craig recognized with a start.

Jeeps! Transported by planes. This was an air-borne attack.

And Anrella was at the house.

He had been descending frantically before that lashing stream of thoughts. Now he reached the ground, and began to run.

He burst out of the brush into an open stretch of meadow, saw the Jeep roaring towards him—and stopped.

Instantly, he whirled and raced again for the fence but—

Fool! he was thinking bitterly. He should have climbed over it in the first place. Men who wanted to save their wives should use a method that might actually save, and not yield to the first wild emotional impulse to fling themselves to the rescue.

It was too late now.

The Jeep caught him when he was still twenty feet from the fence. The cool-eyed women who operated it pointed the steadiest pistols Craig had ever seen.

A few minutes later, at the house, Craig saw that the whole gang had been rounded up: Anrella, Nesbitt, Yerd, Shore, Cathcott, Gregory, all the servants, altogether forty people lined up before a regular arsenal of machine guns manned by about a hundred women.

"Les, you're all right?"

That was Anrella, her blue eyes anxious, her oval face wan and tired.

"Silence!" commanded a deep-voiced woman. But Craig nodded and smiled at Anrella reassuringly.

"That was he all right," reported the leader of the Jeep that had captured him. "I thought I saw somebody on the fence as we were coming in to land. There's a tree there, very close to the fence.

"Cut it down," ordered the deep voice. "And remove other trees that might be used for escape. Put a guard on Lesley Craig night and day; only his wife can be permitted with him. All the others will be removed by plane to Kaggat prison. Action!"

It was an hour before Craig found himself alone with Anrella.

"Darling, what's all this about?"

He felt a dark eagerness as he asked the question. In spite of everything that had happened, by far the most important reality was still—what was behind this incredible business? What did it all mean?

Now, at last, the information could no longer be denied him.

He watched her tensely, where she sat near the window in the great living room. He saw her gaze sweep beyond him to the guards at the doorway, then return and pause on his face. Then—

She shook her head. Amazingly, she shook her head.

The fury of reaction exploded in his brain. He was dimly aware as he leaped to his feet that the swiftness of his anger showed how raw his nerves had worn during these weeks.

He forgot that. In two strides, he reached her chair, loomed over her.

"You've got to tell me," he raged. "How can I even think unless I know more? Don't you see, Anrella—"

He stopped, helpless before her rigid-faced silence. His mind trickled back into his head. The anger was still there when he spoke again, but controlled memory and purpose were now integral parts of the intricate pattern of his emotions. He said grimly:

"You know, I suppose, that no one but Jefferson Dayles could have

sent these women thugs. If you do know that, and know why, tell me, so I can start figuring a way out."

There was a strained look on Anrella's face suddenly. But she did not even glance at him. Craig pressed on:

"When I overheard you at the meeting that day, you said something about a change being due. What did that mean? A change in what? In whom? In *me?*"

"It's in you. I won't tell you anything more than that."

He waved a hand at her, as if he was groping through darkness.

"You've told me this much. Why not tell me more?"

"I haven't told you anything."

Her words stopped him at the edge of a cataclysm of new questions. After a moment, he realized bitterly that she was telling the truth. He still didn't know anything. His bewilderment was greater than ever. He drew a deep breath, but before he could assail her again, she said:

"The change comes more quickly when you're under strain. You can see yourself how important speed is. That's all I'm going to tell you, Lesley. That's final."

Grimly, Craig stared at her white, determined face. Then with a curt hard laugh, he whirled and left the room.

He was through with her, he thought, utterly through with her.

IV.

Craig fingered the rock. He strove so hard for casualness that his hand shook. Alarm came, a fear that he might give himself away. He settled closer to the luscious grass on which he sprawled, surrounded by his seven women guards.

Two inches in diameter was that rock, two inches of inert stone, yet containing in its tiny mass so much of his hope that he trembled in a brief funk—and waited for the boys to come.

Every Saturday since school had started again a month before, he had heard their shrill voices at this time of the morning. They came from beyond the thick fringe of trees that hid from his gaze the iron fence which completely surrounded the estate that was his private penitentiary.

The trees and fence that separated them from him, and him from all the world. He hadn't thought, he hadn't dreamed that escape would take so much planning, such an intricate scheme, and two long months of otherwise uneventful waiting.

During those months, he'd given up wondering why no one came from the office to inquire about him. Somebody must be running the office. And he'd given up even talking to Anrella. The very sight of her brought the conviction that she was treating him like a child—the one unforgivable action.

In minutes now, the boys should be heading past here with their fishing rods towards the deep pools farther upstream— What was that?

A sound, a faint vibration of boyish laughter, far away as yet.

But the time had come.

Craig lay still, tautly examining his chances. Two of the women lolled at ease on the ground a dozen feet to his right. Unless they altered their position radically before the moment of action, they would be the least able to interfere with his purpose.

Three other women, also in slacks, lounged eight feet to his left, and somewhat behind him. They were too close for comfort, and they looked alert, athletic. One synchronized jump, and they'd bowl him over.

He had no inclination to underestimate them. There was no doubt at all in his mind: he had been assigned guards strong enough to handle their weight in men.

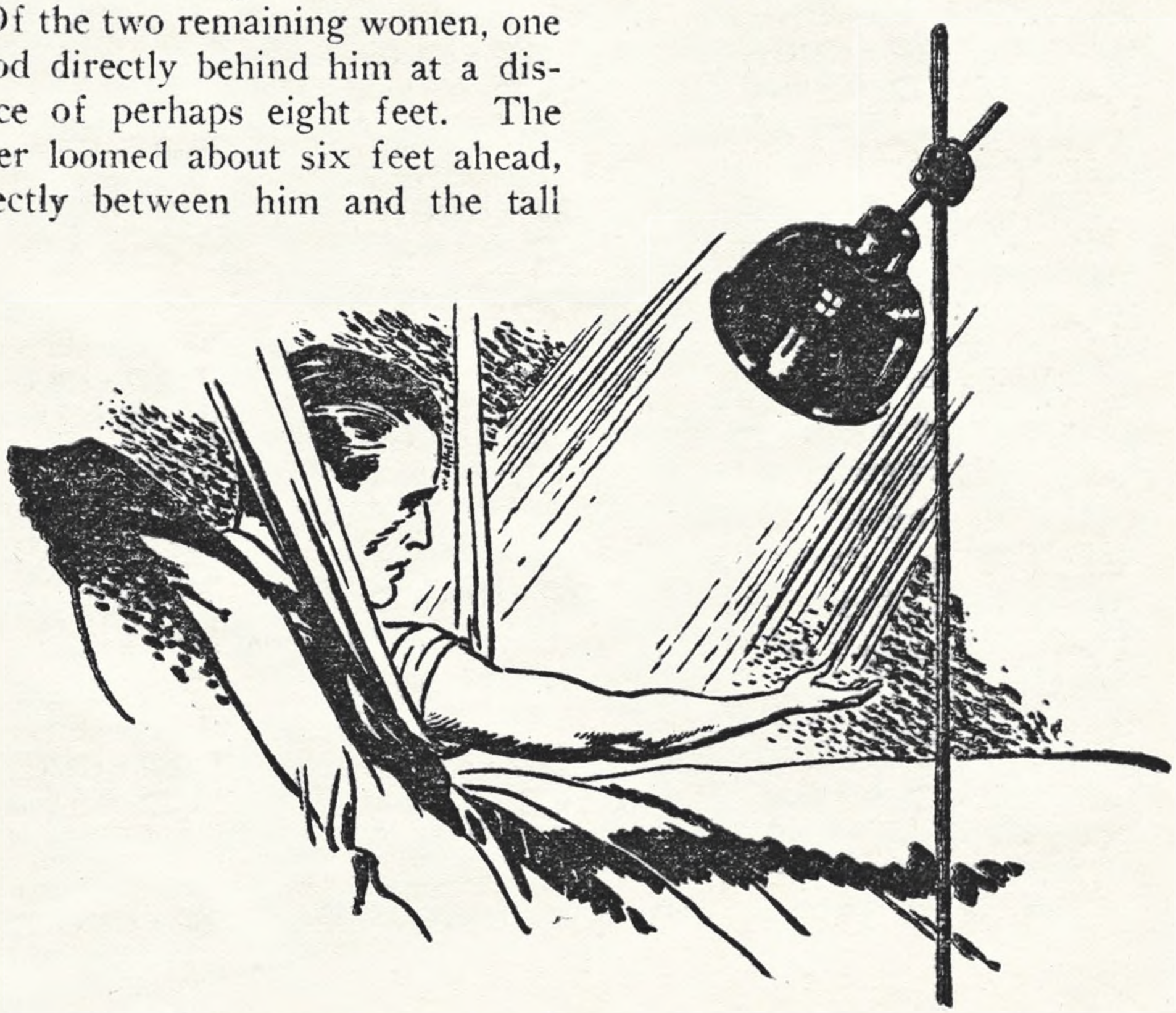
Of the two remaining women, one stood directly behind him at a distance of perhaps eight feet. The other loomed about six feet ahead, directly between him and the tall trees that hid the fence beyond which the boys would be passing. The smoky gray eyes of this powerful creature looked dull and unalert, as if her mind was far away.

Craig knew better than that. She didn't have a mind. She was a Jefferson Dayles' machine; and she was the most dangerous thing on his horizon.

The medley of sound that preceded the boys was nearer.

Craig felt the throb of his temples, as he reached with a forced deliberateness into his pocket and slowly drew out a glass crystal. He held the little thing in his fingers, letting the rays of the sinking sun lance its depths with fire.

It blazed as he spun it into the air. As he caught it, snuffing its



brilliant light, he was preternaturally conscious of eyes on him, the guards watching him, not with suspicion, but with awareness.

Three times Craig flung the glass yards into the sky; and then, as if abruptly tiring of the game, threw it to the ground about an arm's length from him. The crystal lay there, glittering in the sun, the brightest object in his vicinity.

He had given much thought to that glass crystal. It was obvious that no one of the guards could ever maintain a concentrated watch on him. Of the seven, he must assume that three were glancing at him with attention at one moment. When he finally moved, even these would have to look twice, because the reflected flame of the crystal would confuse their gazes and distort their mind pictures of what he was actually doing.

That was the theory—and the boys were nearer.

Their voices rose and fell, a happy babble, now boastful, now in agreement, now one dominating, now all speaking at once. Impossible even to begin guessing how many there were. But they were there, physical realities, the presences he needed for his plan of escape.

Craig drew the book out of his left-side coat pocket. He opened it idly, not at the place marked, but glancing here and there, wasting time, anything to give the women the necessary seconds to adjust their minds to the immensely normal fact that he was going to read.

He waited until his nerves shrieked in protest, until his very muscles quivered from that prolonged strain of mummery. And then—he put the book down on the grass with its top edge pressing against the rock.

He opened the book boldly now, at the marker, which was a sheet of notepaper.

To the guards the letter must look exactly like the score of pieces of blank paper he had used in the past two months for taking notes. What was more, it *was* blank.

In spite of his determination to end an intolerable confinement, actually he had nothing to say to any local authorities. Until he knew what was involved in the whole wretched business, the problem was his. Once outside, he could handle it in his own way.

He felt curiously, tremendously capable.

There was a stirring to his right. Craig did not look up, but his heart sank clammily. The two women there, from whom he had expected minimum interference, were beginning to show life. What damnable luck!

But there could be no delay now. His fingers touched the white missive; perspiring, he shoved it out over the edge of the book, and directly on top of the rock. The sheet with all its carefully attached elastics, which needed only to be slipped over the little rock, to clutch at it with dozens of tiny rubber strands.

How many hours in the privacy of his room he had practiced that

synchronized act. With a yell—that too was psychology—he lurched to his feet, and, with all his strength, flung the stone and its white fluttering cargo.

He had no time to recover his balance, protect himself. Two bodies struck him simultaneously from different angles, flung him ten feet. Craig lay where he fell, dizzy from the blow, but conscious that he wasn't hurt.

He heard the leader, the big woman who had been standing in front of him, snapping commands:

"Carla, Marion, Jane—back to the house—get Jeeps—cut those kids off from town. Quick! Rhoda, head for the gate, open it for them. Nancy, you and me will climb that fence, and chase after them, or hunt for that letter. Olive, you stay with Mr. Craig."

Footsteps raced off in several directions. Craig waited. Give them time. Give Nancy and the leader opportunity to climb the fence. Then—

At the end of two minutes, he began to groan. He sat up. He saw that the woman was watching him. Olive was a handsome though rather big-boned woman with a thin mouth. She came over.

"Need help, Mr. Craig?"

Mr. Craig! These people with their polite solicitude, were enough to drive anybody crazy.

On the one hand, illegal imprisonment; both sides had been equally ruthless there, and equally tender in the administration. The first group, however, had had the best of the tenderness. Up to three months ago, they had included among their kindnesses a fifteen thousand a year job, a loving wife, a home and an estate on a grand style.

What was behind it?

That's what he was going to find out, but in his own way; not waiting here on somebody else's say-so. And if he was ever going to escape, it had to be now. The trick for getting rid of his guards would not be repeatable.

Physically and mentally, Craig stiffened himself. He made a struggle out of climbing onto one knee. Then he knelt there, shaking his head, as if he was still dazed. He muttered finally:

"Give me a hand."

He wasn't counting on the woman actually assisting him, although even that was possible in view of their helpful attitude generally.

But she did. She came up, and started to bend down. That was when Craig started up. There was not an ounce of mercy in him in that moment as he struck. These women, with their guns and their ruthlessness were asking for trouble.

A lightning one-two, one-two to the jaw ended the engagement in the first round.

Olive went down like a log. With utter abandon, exactly as if he were attacking a man, Craig plunged on top of her, and rolled her over. In a single synchronized movement, he drew from his pocket the gag he had prepared.

It took about a minute to tie it over the flabby mouth.

More leisurely now, but without waste effort, Craig unstuffed his shirt tails, and began to unwind the tough laundry rope from his waist. As the woman started to squirm weakly, he began his tying-up job.

It required a little over three minutes. He stood up then, shaky but calm. He wasted no further glance on his prisoner, but strode hurriedly off, keeping for a while parallel to the fence.

He pushed through the trees finally, scrutinized the territory beyond the fence, and it was as he remembered it: thickly wooded. Satisfied, Craig approached the fence, and began to climb it.

As he had discovered in his first attempt, more than two months before, the fence itself was not hard to climb. It was like, with some variations, shinnying up a rope.

He reached the top, and, eager now, hitched himself over the spear points of the fence.

Afterwards, he realized that he had become too eager.

He slipped.

He made a second mistake, then; the instinctive mistake of trying blindly to save himself. As he fell, one of the spears jabbed his left forearm just below the elbow, and went through.

He hung there, his arm skewered to that meat hook of a fence. The pain crashed and roared through his body, and something warm and salty and viscid spurted against his mouth and into his eyes, a choking, blinding horror.

For seconds there was nothing else.

He was lifting himself; that was the first thing Craig knew over and above the tearing agony. Lifting himself with his right arm and, simultaneously, trying to raise his left forearm clear of the dark, clumsy spear that had transfixed it.

Lifting! And succeeding! *Succeeding!* Gibbering, he fell twenty feet to the ground below.

He struck hard. The muscles of his body were pain-clenched cords that had not a fraction of give in them. The blow of landing was a bone-jolting smash from the sixty-six million million billion ton battering ram that was Earth. His brain joggled in its cranium. He fell to his knees, then got up again like an animal, with only one impulse left to its shattered body:

Get away! Get out of here. They'd be coming, searching. Get out! Get going!

No other consciousness touched Craig till he reached the stream. The water was warm, but it was a late-October warmth. It soothed his burning lips; it brought sanity back to his feverish eyes. He washed his face, then struggled out of the left sleeve of his coat, and soaked and washed his arm.

The water turned red; the blood welled and bubbled from a wound so gaping and terrible that he swayed, and just in time flung himself backwards onto the grassy bank.

How long he lay there, he had no conception; but a thought came finally:

Tourniquet, or die! With an effort of will as much as strength,

he tore the damp and bloody shirt sleeve at the shoulder, and wound it around and around the upper part of his arm.

He twisted it tight with a short, broken end of tree branch, so tight that it hurt his muscles. His arm began to tingle, a not unpleasant tingle. The bleeding stopped.

He staggered to his feet, and began to follow the stream. That had been his original intention; and it wasn't that he remembered it now coherently. His body simply reacted; it was easier to follow a previously chosen route than to think out a new one.

Time passed. Just when the idea came that it wouldn't do to go straight to the savings bank, he had no conception. There was a vague memory of meeting someone and saying:

"Hurt my arm! Where does the nearest doctor live?"

There must have been an answer. Because after another lapse of inestimable time he was walking along a street thinly overhung with autumn foliage. He realized at intervals that he was looking for a plaque with a name on it.

All feeling was long since gone out of his arm. It hung down, swinging as he walked, but it was the lifeless sway of an inanimate object.

He grew weaker, and weariness lay on him like a terrible weight. He kept touching the tourniquet, to make sure it wasn't loosening, and permitting the blood that still remained to him to seep out. Then he was climbing steps on his knees.

"Christmas!" a man's voice said. "What's this?"

There was a gap, through which a voice percolated at intervals; then he was in an automobile, with that same voice waxing and waning at him:

"You incredible fool, whoever you are—you've had that tourniquet on an hour at least. Didn't you know—tourniquets must be loosened every fifteen minutes—to let the blood flow—arm must have more blood to stay alive. Nothing now but amputate!"

Craig wakened with a start, and stared dully at the stump of his arm. His whole shoulder was raised on some kind of a netted sling; and the arm was bare and plainly visible.

An infrared lamp was pouring its heat upon it, and the remnant felt cosy and comfortable, not at all painful.

It was not bleeding; and there was a growth from it, a curled, pink, fleshy thing that seemed like some torn part of the shattered arm, which for some reason had not been cut off. That is, for a moment it seemed that. Then—

He saw that it had a shape. The foundations of his brain began to rock. He stared and stared; and there was a memory in him of a military record that had read: "Amputation of leg necessitated by—"

He slept.

Far away, a man's voice was saying: "There's no longer any doubt.

It's a new arm growing in place of the torn-off one. We've been doing a little surgical work—though, as I said to Pentry, I'm hanged if I don't believe the growth is basically so healthy that it could get along without medical attention. It'll be several days before he regains consciousness. Shock, you know."

The voice faded, then came back:

"Toti-potent . . . toti-potent cells. We've always known, of course, that every human cell has latent in it the form of the whole body; somewhere in the remote past, the body apparently took the easier course of simply repairing damaged tissues."

There was a pause; and Craig had the distinct impression that somebody was rubbing his or her hands together in satisfaction. A second man's voice murmured something inaudible, then the first voice went resonantly on:

"No clue yet to his identity. Dr. Philipson, who brought him here, never saw him before. Of course a lot of people from both Big Town and Middle City live all through the Alcina district but . . . no, we're not giving out any publicity. We want to watch further developments in that arm first. Yes, I'll phone you."

The murmuring, second voice said something, and then there was the sound of a door closing.

He'd have to tell them, Craig thought. He'd have to tell these doctors as soon as he felt a little less drowsy, about the imprisonment. Anrella had to be freed.

They *knew,* Anrella and the others, though why they hadn't told him—and why they had taken all those precautions!

The tense emotion dimmed. What was it Anrella had said that first noon when he had overheard her speaking to the others, about the time for the change having come.

This change! It must be a periodic transformation inside him. It must have happened before.

But why hadn't they told him? Why?

Sleep came like a soothing blanket of forgetfulness.

"Try!" the man was saying. "Try to remember!"

A trickle of sweat sagged down Craig's face. All through his lean, strong body, he felt the gathering tension of enormous effort, and there was a sudden high pain in his arm. In the vaguest way, he was aware of the white-starched figure of his nurse, and of another nurse sitting with pencil poised over a notebook, and of the dark night beyond the window.

He gritted the pain out of his mind; and, with the whole strength of that mind, strained to penetrate the mesh of waver and blur that lay like a cloak over his memory. Pictures took vague shape there, formless thoughts and shadow memories of days unutterably dim. It was not memory but memory of memory. He was isolated in a little island of impressions of the moment, and the terrible sea of blankness all around was sweeping closer, pushing harder every min-

ute, every second.

With a gasp, he let the pressure of strength and strain go limp inside him. He stared helplessly at the doctor.

"Useless," he said simply. "My name, I think is . . . is—" He stopped, and shook himself. "I can't remember. There's something about an iron fence and—what city is this? Maybe that will help?"

"Middle City," said the doctor succinctly. His brown eyes watched Craig narrowly. But the latter shook his head.

"What about Big Town?" the doctor asked. "That's a city about forty miles from here. Dr. Philipson brought you to Middle City from Alcina because he knows the hospitals here."

He repeated it slowly: "Big Town!"

For a moment there seemed to be a fuzzy familiarity. And then he shook his head. He stopped the weary movement, as an idea struck him:

"Doctor, how is it that I can use language, when everything else is so dim?"

The man stared at him unsmiling, grim:

"You won't be able to speak in a few days, unless you spend every spare minute reading and talking just to keep those particular conditioned reflexes alive."

He was aware of the surgeon half-turning from him, facing the two nurses:

"I want a detailed, typewritten account prepared for the patient, giving the complete story of his case, as far as we know it. Have a radio brought in here, and"—he turned back to the bed, smiling darkly—"you keep it on. Listen to the soap operas, if no one else is talking. When you're not listening or sleeping, read, read aloud."

"What if I don't." His lips were ash-dry. "Why do I have to do this?"

The doctor's voice was grave:

"Because, if you don't, your brain will become almost as blank as a new born baby's. There may be"—he hesitated—"other reactions, perhaps of a marvelous nature, but we don't know that. We do know that you are forgetting your past at an alarming rate. The reason for that is as follows:

"Ordinarily, the cells in the human body and brain are in a continuous state of being used and being repaired. Every hour, every day, your billions of memory cells are undergoing that repair; and apparently, in the mending, the little wave of memory electrically stored away, is not damaged, at least not seriously damaged. In the long run, no doubt, the replacement of tissue diminishes the story of memory. Perhaps, there lies the true explanation of why memories go dimmer with the years.

"Now it's different: You have at this instant toti-potent cells. Instead of being repaired, your cells have been replaced by brand new, healthy cells; and those new cells know nothing of the memory carried by the old, for memory is not hereditary.

"You have then cells as potentially capable of storing memory as your old ones, but all you can store in them before they in turn are replaced, will be the impressions gained by your mind in a period of, say, a week, perhaps a little longer."

The doctor finished briskly: "Your name, for the record, will be Peter Smith. Try to remember that, will you?"

He examined the name mentally: "Smith!" he said finally, aloud. He lay, listening to the rhythm of it go through his mind, then repeated: "Peter Smith."

"That's right," said the doctor. "Now any questions?"

"Yes. Why not take me to the town of Alcina? I have a conviction"—Smith paused, and a tenseness welled up inside him, a thickening of his neck muscles—"that it's very important."

"Impossible!" The doctor spoke sharply. "I assure you we are doing all we can to identify you. Tomorrow's issue of the Alcina Weekly Herald will contain a story about you. But you can't leave here now. Your arm was amputated only thirteen days ago!"

"But I feel all right."

He saw that the argument was useless. He lay back. The doctor said:

"Just rest yourself—and do as I've said."

There was a sound at the door, an intern looked in. "Thought you might be interested," he said. "The word was just flashed on the radio. Jefferson Dayles is re-elected president by a majority of two million."

"Thank God!" said the doctor, sighing. "I thought sure a neurotic America would elect that woman. I have no doubt she's intellectually capable and could handle the job. But it's too fast, a passing whim of an unstable electorate. Reaction would be just as swift, and could easily destroy all the built-up progress of the last two centuries. Women must take over their half of the political power gradually, not in one emotional spree."

"Oh, you men!" said one of the nurses in quiet fury.

The second nurse snapped: "Don't forget it was only two million majority. Next time—"

They went out. The silence of night settled. Twice, as he lay there, footsteps moved along the hallway, grew loud, and receded into distance.

He lay quiet, completely awake. He thought: "I wonder what a radio is."

He thought: "Have to get to Alcina. Can't wait!"

He climbed out of bed. There was no sense of pain, or dizziness. It did not occur to him that he was not dressed for outdoors. He knew better though than to leave by the door.

The window opened hard. But there was a metal fence beyond, and a narrow metal staircase leading down.

He went down into the strange world of night. A chill wind was blowing, but the warmth of the bed was still in him; and the discomfort seemed unimportant. His bare

feet began to hurt after he reached the ground, from the roughnesses that he kept stepping on. But he pressed forward grimly until he came to a hard, smooth surface.

Two lights in the distance of that dim lit street attracted his attention, because they moved. And they made a roaring sound.

The lights and the sound fascinated. He stepped towards them out of the shadow of a tree, intrigued.

In a flash they were upon him. At the last instant, he saw that behind the lights was a large, black shape.

There was an unimaginably hard blow, then a faraway squealing sound, then distant voices:

"We're drunk, all of us. Nobody'll believe he stepped into our path—jail for sure. Quick, get him into the car, then first to Ned's place —to get some more gas—then we'll dump the body a hundred miles from here. Hell, fellows, we've got to do it. We can't afford—"

For a week, the thing that had been Lesley Craig lay in a ditch, very still—re-growing!

V.

Jefferson Dayles studied the report of the scientists on the eve of inauguration. The first perusal left him with a blank consciousness of puzzlement. Later, he thought, later when the excitement was over, he would read it more carefully.

But he took it to bed with him, and in the middle of the night rose and re-read sketchily the astounding document:

In the matter of the two so-called electric-engined automobiles and the so-called electric-engined plane turned over to us by your agents . . .

Electronic-engined would have been a better term. The motive power seems to be derived from a dark metal electronic tube which, when taken apart, proved too intricate for reassembly, in spite of all our careful notations on each phase of the process . . .

As this failure resulted in spite of the fact that we took apart, not one, but two of the engines, we have determined not to dismantle the third and last engine until after a very careful and, we recommend in the event others are assigned to the investigation, a very exhaustive study of the parts of the two tubes already dismembered.

It is possible the secret of their reaction may lie in some subtle alloy combination of the construction materials. Even the welding compound must be examined and analyzed for its possible influence . . .

The surpassing importance of cautious development can best be gauged by our discovery that the engine will take aloft a wingless propellorless plane . . .

Jefferson Dayles crawled back into bed, and lay in the darkness with closed eyes thinking: It was the old, old story: Too complicated for mortal minds.

As he took the oath for his second term, Jefferson Dayles thought: Three years, not more. Three years to find him.

After that it might be too late.

Too late, too late—all that great day the words trampled through his mind, dulling his smiles, dimming his exulation, darkening all his thought.

Find Craig! Find the man whose blood could in one week strip old age from his body, and, in so doing immortalize his power and the mighty civilization he visualized. *Find* him!

The thought was like a sickness, a craving—that was still upon him six months later when they brought in the farmer.

The man was big and rangy. As he sat listening to the fellow's extremely colloquial account, one question quivered in Jefferson Dayles' mind. The problem of how to phrase it engaged his attention, as the farmer's voice twanged on:

". . . Like I was sayin', he was at my place ten days, an' old Doc Gillespie came twicet to look at him, but he didn't seem to need no medical attention, only food. Mind you, he did act queer. Wouldn't tell me his name nor nuthin'.

"Anyways, I finally took him to Carness and turned him over to the employment commission. I told the feller in charge that his name was Bill Smith. He didn't argue none about that, so that's what they put him down as—Bill Smith. There was some labor job they sent him to, can't just recollect what it was. Anything else you wanta know?"

Jefferson Dayles sat cold. But that was an outward covering for an inner excitement. Craig was alive. Discovered, so Kay had said, when an old news item was followed up, a news item which reported that on November 21, 1972, somebody had called the police department of the nearby city of Carness and reported a body in a roadside ditch.

Actually, this farmer had already found Craig when the phone call was received. So it was obvious that the person making the call must have been one of those responsible for leaving Craig in that icy gutter. Somebody become conscience-stricken, or perhaps simply anxious to get the whole affair over and forgotten. The exact psychology of it didn't matter.

The toti-potent man was alive.

There was the one question that remained, a verification: Craig's arm! The one that had been regrowing. The farmer's voice came again:

"There's one more thing, Mr. President—"

Jefferson Dayles waited, involved in the preparation of his question. It was a hard sentence to utter because, well, you couldn't ask if a human being's arm had re-grown. You couldn't, although the very idea was fascinating and mind-staggering and—

"The thing," said the farmer, "is this: when I picked him up, I coulda swore one o' his arms was shorter'n t'other. Yet when he left, they wuz the same length. Now, am I crazy or—"

"Doesn't make much sense, does it?" said Jefferson Dayles. He went on quietly: "Thank you for your assistance. My secretary will see to it that you are well paid for your trouble. You will, I hope, continue to regard silence about this interview as a duty to your country."

"You kin count on me," said the man with the quiet positivity of sublime and unquestioning patriotism. "An' you kin forget about the money."

But Jefferson Dayles had his own conscience to assuage. He mustered a smile. "No," he said, "we mustn't forget money. It's a valuable aid to good living, so I've been told."

As a clerk Prowse rather fancied himself. He spent a large fraction of his money on clothes, and, in the beginning, he was always charging up and down the long aisles of the Workman's Compensation board offices, past the men who were really working, and not simply pretending.

Neat, natty little man, he nursed a tiny, obstinate mustache, and an attitude of coarse humor towards his superiors. They must have thought it showed an adult trend of mind, for in seven years, which was literally no time at all in such a dead level organization, he was chief of one section of the filing department, a sharp-tongued, fault-finding straw boss.

Ossification of the brain set in at the ripe age of thirty-one, and his ephemerally youthful body began to dry up. At thirty-five, he was a little, bespectacled runt with cold, blue suspicious eyes and a hatred of the world that, though he couldn't figure out just how it had happened, had done him dirt.

To his desk in December, 1973, were brought two files under the names of Bill Smith and William Smith. Bill, according to the statements in the document, had had his left arm cut off at the elbow. And William had lost the fingers of his left hand at a somewhat later date. In both cases compensation was being paid at the full allowable rates, but that was only incidentally important.

What interested Prowse was that Bill and William Smith both lived at Apartment N, 111 Hunt Street.

"Shall I combine the two files?" said the wan-voiced female slave, who had discovered the similarity.

"Leave them on my desk," replied the pontiff.

He meditated over the problem during the next half hour. If the fingers had been lost *before* the forearm, the identification would have been simpler.

But they hadn't. And there were the doctors' signatures and all other necessary data. It was a situation requiring all the curious and complicated skills of the head of a filing department, requiring moreover a decision.

Frowning, Prowse studied not only the files but the index cards in the cabinets. There were eleven blocks of "Smith" cards; and among them he found five other cards, one of them under the name of Bill, and the others were, in alphabetical order, Frank, George, Milton and Tom.

The seven Smiths possessed among other common denominators, according to their files, the fact that they all lived at apartment N, 111 Hunt Street.

The new Bill had lost his right hand. Frank Smith had suffered

severe head and shoulder injuries. George's face had been smashed. Milton and Tom had each lost a left arm.

In every case the name of the wife was given as Gracie Smith, and it was to her that the checks for compensation were made out.

"Naturally," Prowse finished his story to the president, "we had him arrested."

He shook his head wonderingly. "He was a pretty smart chap, that fellow Smith. The woman had skipped with the money; and Smith just played dumb at the trial, never saying a word. Because of our inability to prove how it had been done, the judge only gave him six months. He got out," Prowse finished, "four months ago."

Four months— It turned out to be four months too long. The trail ended at the prison gate. A guard recalled that a car had been waiting for Craig. It drove off into the oblivion of the vast land that was the United States.

Women won two-thirds of the contested seats in the mid-term elections. And went mad with hope. By the end of November every city had its daily parade, its line of sullen men watching, and other men cheering.

Jefferson Dayles had allowed the election to be honest because he was genuinely anxious to learn the exact situation and because—

"Women," he told Kay, "might as well discover before it's too late that politics are a painful business for the physically weak. Men have fought to an uneasy balance, which has made for a false atmosphere

of quiet and dignity. I firmly expect that the men who are now such ardent supporters of women in Congress will be the most violent enemies of women in time."

He smiled with a savage sardonicism. "Prepare the hospitals," he said, "for women with broken heads. and the jails for the men who break them—and find Craig, or we'll be swamped by a sea of emotionalism."

The year ground heavily towards its end—and didn't quite make it unscathed.

On Christmas Eve, press wires hummed, radios broke off programs to announce: Los Angeles—A long line of women marching with placards—"HURRAH FOR THE RIGHTS OF WOMEN" "IN THE WORLD OF THE FUTURE MEN WILL DO THE PHYSICAL WORK WOMEN THE ADMINISTRATIVE" "A JUST ORDERLY PEACEFUL WORLD ADMINISTERED BY WOMEN—"

A man's interrupting shout—"Break it up, let's break it up. They're counting on us to respect them, while they make slaves of us. Come on."

Men surged sullenly from the sidelines, and became a mob. When armored cars finally cleared the streets, twenty-four women lay dead, ninety-seven others were seriously injured, and more than four hundred required hospital treatment.

The pathological nature of the assault was revealed when four of the men accused of murder proved with the assistance of lie detectors that they had voted for women in the elections. They were unable to account for their violent change of heart, except for one who stated plaintively that he suddenly "saw that there would be hell to pay if women ever really got into power."

Three days before the date set for their execution, all of the seventeen men condemned for the parade killings staged a mass escape from the death house.

There were riots in a dozen cities, and mass delegations of women demanded punishment for the prison guards responsible, and that the escaped men be immediately recaptured and gassed.

It was a crisis of the kind that could win or lose five million votes; and Jefferson Dayles made a speech to the nation, promising all possible action would be taken.

On the second day following his speech, the letter arrived, the letter which read:

Cell 676, Kaggat Prison,
January 27, 1975.

Dear Mr. President:

I have learned that my husband was one of the seventeen condemned men, and I know where he and they are. Speed is essential if his life is to be saved. Please hurry.

Anrella Craig.

The cell did not look as comfortable as he had originally ordered it should be. Jefferson Dayles made a mental note to deliver a sharp reprimand on the matter, then turned his attention to the pale creature that was Anrella Craig.

It was his first face-to-face contact. And in spite of her bleached appearance, he felt impressed. There was something about her eyes, a dignity and power, a maturity that was oddly disturbing.

After that first impression, the dullness of her voice surprised him. She sounded more beaten than she looked. Anrella Craig said:

"No, I *want* to tell you. Lesley is in hiding in great California desert. The ranch is located about forty miles southeast of the village of Mountainside—

"Please don't ask me under what circumstances he did what he did. The important thing is to make sure when you find the hideout, that he is not killed."

She smiled wanly. "Our original belief was that, as a group, we could through him dominate world affairs. I'm afraid we overestimated our capabilities."

On the north-bound plane, Kay said:

"I see no reason why either Mrs. Craig or any of the others should be released. Now that she has so foolishly revealed her ace in the hole, Craig's identity as one of the parade killers, we owe her nothing. She—"

There was an interruption. "A radiogram message, Mr. President, from Kaggat prison."

Jefferson Dayles read the long message with pursed lips, then handed it without a word to Kay.

"Escaped!" Kay cried. "The whole gang!" She sat very still. "Why, the little, white-faced actress, standing there pretending to be depressed to the point of nothing-else-matters-but-that-he-be-saved. But why did she tell us? Why—"

She stopped, and re-read the telegram, and whispered finally:

"Did you see this? Ninety planes participated in the rescue. What an organization they must have. It means the escape could have been managed at any time. And yet they waited till now. Sir, this is very serious."

Jefferson Dayles felt curiously remote from his assistant's half panic. His mood was exhilaration, and there was in him an intense and gathering will to victory.

The situation was indeed serious; here, in fact, was the crisis but— His voice lashed out a staccato of orders:

"Kay, you will take personal charge. Use at least five divisions, at least two of them armored, and as many planes as you need, not ninety but nine hundred or nine thousand. Surround the desert. Check all traffic on land or in the air moving out of it. Use radar detectors at night, searchlights, night fighters. I give you unlimited power to use all the available forces of the United States. Capture Craig!"

He was, he realized, literally fighting for *life*.

VI.

Craig wakened. It wasn't anything to think about. Where there had been blackness was suddenly light. He lay very still. He had no consciousness that he had a name, or that there was anything

unusual about the situation. *He* was here—the entity that was himself—lying down.

Even the posture seemed normal, the very essence of life as it was lived: He lying down, and aware of himself.

For a long, long time that was all there was. He had no purpose other than being where he was, no memory of anything else, not the faintest conception of movement.

He lay, and he stared up at a ceiling that was light-blue in color. It was not the brightest region in his universe and so, after a while, his eyes were drawn to the window through which light blazed dazzlingly.

Like a child absorbed by shiningness, he brought up his arm, and reached towards the window. The intervening emptiness rebuffed him. Instantly that didn't matter, because he became interested in his groping arm.

There was no realization in him that the arm was a part of himself. The moment he ceased his instinctive reaching, the muscles that supported the arm in the air began to relax. The arm collapsed onto the bed; and, because his gaze had followed its clumsy fall, for the first time he grew aware of the bed.

He was still examining it, half sitting up the better to look at it, when the sound of footsteps intruded upon his attention.

The sound came nearer, but he did not wonder about it. It was there in his ears, as normal as everything else.

The difference was, he was suddenly mentally divided into two sections. One part remained in the bed; the other stared out at the world through the eyes of a man who was coming through an adjoining room towards the door of the bedroom.

He knew the other entity was a man, and that the room-door-act of walking were what they were because, to the second part of his mind, those facts were casual realities of life.

The second mind was aware of other things too; and so rapid, so completely absorbent was his own brain that, as the door opened, he swung his legs off the bed, and said:

"Bring my clothes, will you, Peters?"

Peters' brain took the impact of the demand with complete acquiescence. He went out, and there was a satisfying mind picture of him fumbling in a clothes closet.

He came back, and paused just inside the door, blinking with new thought. He was a little man in shirt sleeves, carrying a lot of clothing; and he peered over them, and said owlishly:

"Lordy, Bill, you can't get up yet. You were still unconscious half an hour ago when we caught that dame in here."

He broke off solicitously: "I'll call the doc and bring you some hot soup. After the way you got us out of the death house, we're taking no chances of anything going wrong with you. Lie back, will you?"

Craig, watching the other lay the clothes on a chair, hesitated. The

argument seemed reasonable, yet somehow not quite applicable to him. After a moment he still hadn't put a mental finger on the flaw.

Hesitation ended. He drew his legs back under the quilt, said:

"Maybe you've got something there. But the way that woman was captured right in this room, started me worrying about our hideout here."

He stopped, frowning. Flashing insight came that he hadn't been worried until Peters appeared on the scene, and that in fact his mental state at the beginning had been—

What?

Memory galvanized his thought. His mind twisted back to the moment of his regaining consciousness.

It was amazingly hard to picture himself as he had been at that first instant, blank-brained, without memory; and then instantly absorbing the entire mind of Peters, with all Peters' fears and emotional immaturities.

The only thing was, his memory took in Peters' brain and Peters' knowledge. But nothing else. Nothing of himself.

Astounded, he stared at the man. The profound yet swift examination took in all Peters' memory, and went back through the simple career of a chunky boy who wanted to be a mechanic.

No particular reason existed why Peters should have joined the mob that attacked the parade of women. And the actual mob scene was blurred, the trial that followed, a nightmare of twisting thought forms dominated by fears so terrible that not a single image came clear.

The fear had faded into excited hope during the escape; and so there was a reasonably detailed remembrance of exactly how the prison break had been worked three days before the date set for the mass hanging. He—

"What," Craig thought incredulously, "*what* did I do?"

After a moment the fact was still there, a rigid part of Peters' memory of the event:

He had taken apart the radio in his cell and, with the addition of parts from radios handed to him from other cells, had manufactured a very pale white light that ate through concrete and steel as if they were insubstantial matter.

A guard confronting them had screamed as his gun dissolved in his hands, his clothes disintegrated from his body. The scream must have been pure hysteria, because that pale intense fire had not harmed him.

The very nature of the weapon, and the mode of exit it provided, prevented the reinforcements brought by the scream from being fatal. The police didn't think of solid walls being breached. The cars were at the arranged rendezvous, and the planes each with its pilot were concealed beside the grass field across which they took off.

All this was in Peters' memory, as well as the fact that the man

known as Bill Smith had been hit by a machine-gun bullet, as the cars raced away from the prison—the only casualty—carefully looked after.

For ten days he had lain unconscious; and now—

He pondered about it while Peters went for the soup. And decided: He was different. It needed only the simplest reflection to realize that reading a mind, actually absorbing another's brain, was unheard of in Peters' lexicon of life.

He was slowly sipping his soup when Doc McLarg came in.

Seen face to face, and not merely as a memory image of Peters' transferred mind, the doctor was a spare-built man about thirty-five and possessed of shrewd brown eyes. The history behind that physical exterior was more complicated than that of Peters, but the relevant facts were simple.

A public health officer, McLarg had been forced to resign because of careless work—replaced by a woman doctor. On Christmas Eve, in an advanced state of poverty and drunkenness, he had joined lustily in the attack on the parading women.

His examination was that of a nonplussed man. "It's beyond me," he confessed finally. "Ten days ago, I cut a machine-gun bullet out of your chest, and for three days now there hasn't been either an entrance or exit wound. If I didn't know it was impossible, I'd guess you were perfectly well."

There seemed nothing to say to that. McLarg's mind had slipped so gently into his, its knowledge so easily and naturally integrated with that derived from Peters that, even now, it was hard to grasp that the information hadn't been there all the time.

He thought about the woman later, frowningly. She had been in this room, bending over him. She had just walked in, she had said.

Walked in unseen—into a den of alert, hunted outlaws!

It seemed ridiculous. Uncertain what to do with her, the men had finally locked her in one of the spare rooms of the hacienda.

It was odd that, though the house blurred and wavered with thoughts, as men went tensely to and fro, hers was not among them. Not once did he catch even a tendril of mind stuff that might be a woman's. Surely, a woman's thoughts would be unmistakable.

Sleep found Craig still puzzling over the whole problem of her.

VII.

He wakened with a start in pitch darkness, conscious that there was someone in the room.

"Quiet!" the woman's voice whispered in his ear. "This is a gun."

The paralyzing thing was that he couldn't catch a glimmer of her thought. His mind leaped to his earlier speculation on the subject, and then to the simple, finally proved conclusion: *He couldn't read the minds of women!*

"Huh!" he began blankly, "what —"

In the darkness he felt the metal pressing against his head, and his thought suffered a dreadful pause.

"W-what?"

"Take your clothes—never mind dressing—and walk slowly to the door of your clothes closet. There is an open panel inside with steps leading down. Go down them!"

In a sweat of mental agony, he fumbled for his clothes. He was thinking: What? How? W-why, her room was guarded and—

"I wish," he whispered hoarsely, "the others had killed you instead of just arguing about it, you—"

He stopped because the gun was pressing against the back of his pajama coat, urging him along.

"Quiet!" came the peremptory whisper. "The truth is, Lesley, you're to be given a few facts about yourself before the authorities close in, as they will do very shortly. Now, please hurry."

"What did you call me?"

"Move!"

He walked slowly, but his mind was like a clenched fist, tightening around the tremendous reality that was here.

She knew him. This woman they had captured, this—what was her name?—Anrella Craig *knew* his real identity.

He had had a vague plan of whirling on her in the darkness, and grabbing her gun. But that was shattered now by her words.

He had to squeeze through the panel; it was so narrow. The staircase was a winding affair that led steeply downward. After the first full turn, a series of tiny cosmobulbs began.

Their misty rays made the passageway seem more alive, more real. For the first time, the fact of them made an impact on his brain: An old ranchhouse to which seventeen condemned murderers had fled turning out to be honeycombed with secret panels. An accident? Never.

One swift grab at her legs, he decided, one grab.

"Lesley!" Her voice was a sigh from behind him. "I swear that this will not add one iota to the danger you are all in. When you consider that it is our organization that placed those cars and planes at your disposal when you escaped from the prison, you—"

"What?" He stopped, protested. "Listen, those cars and planes were given us by the friend of—"

"An individual giving four cars and two planes. Don't be silly."

"But—"

He broke off, fascinated by her logic; then:

"You keep calling me Lesley. Lesley what?"

"Lesley Craig."

"But your name is Anrella Craig."

"That's right. You're my husband. Now, move down those steps."

"If you're my wife," Craig flashed, "you'll prove it by giving me the gun, and trusting me. Give it to me."

The weapon was thrust so quickly past his shoulder that he blinked at it, then reached for it

gingerly, half expecting it to be withdrawn.

It wasn't. His fingers closed over it, hers released it. He stood with the gun, nonplussed by the easy victory, feeling stripped of all possibilities of violence.

"Please go down," her voice came.

"But who is Lesley Craig?"

"You will know in a few minutes. Now, please."

He went. Down, down, down. Twice they passed solid steel plates that pressed out to every wall of the staircase, like floors of protective battleship deck metal. The thickness of them made Craig stare. Eight inches. *Each!*

Here was a fortress.

The end came suddenly. A narrow corridor, a door, and then a blaze of lights, a great room filled with machines. There were doors leading to other rooms, tantalizing glimpses of gleaming staircases that went down—tantalizing because they suggested other great tiers of rooms below.

The weight began to lift from his mind; the weight of conviction that had lain all afternoon on his brain and body, the conviction that he and Peters and the others had no chance of escape.

Here—in this subterranean world—was chance.

His brain squeezed out of its prison of depression. It began to work faster; he felt the surge of new life. A sudden abnormal alertness it was, a glow diffusing his whole being.

His gaze flashed the rounds of the machine room, questioningly. His mind strained to locate signs of human occupancy.

He had time to notice keenly that even the thoughts of Peters and the others did not penetrate into these metallically sealed depths; and then—

A door clanged open in the wall to his right; three men emerged. The physical act of the emergence scarcely mattered. At the very instant of the door opening, their thoughts, their brains, darted out to him.

A veritable flood—thoughts about himself, his past, his *life*. Through that turmoil of impression, Craig heard one of the men whisper to the woman:

"Any trouble?"

"None. All the elaborate precautions were unnecessary. Their search was cursory in the extreme. They did talk halfheartedly about killing me, but I could have frustrated that at any time. Not once did anyone so much as suggest examining the buttons of my clothes for secret gases . . . but *ssshh* now, let him get what's in your minds without interruption."

The man's voice came: "He's getting it all right."

The picture that came was limited in time. It began around the time that Nypers had first hinted to him of wrongness. Later, it showed him being picked up by an old farmer from the ditch where he had been tossed.

Who had tossed him there was not clear, because they hadn't lo-

cated him until a week later. From that point on, however, he had never been out of their sight although not once, until he was released from jail, after being convicted of violating the Workman's Compensation Act, had they interfered in his life. They had not even protected him from the moral leper of a woman who had collected the compensation for his injuries.

They had taken him finally, however, to one of their headquarters. And immediately after the parade killings had rushed him to Los Angeles, faked photographs implicating him in the attack and—

Craig broke the silence in a strained, astounded voice:

"Am I to understand that Peters, McLarg and I, Kelger, Rainey and the others, are going to be kept up there on the surface while the United States army and air force tries to capture us—and you're going to stand by and watch us try to figure a way out, but do nothing to help us?"

He saw that his—wife—was nodding coolly.

Her eyes were bright and oddly sympathetic. "You're in the spotlight, Lesley. You've got to do even better than when you escaped from the jail. You've got to lift yourself almost literally by your mental bootstraps, and become a superman.

"You see, you're in the final phase of your final change. Whatever you raise yourself to now will be permanent. No more changes. You either become like the rest of us toti-potents or—"

Her eyes lighted. Her hands reached forward impulsively and caught his arm.

"Lesley, don't you see? *Don't you see!* We owed it to you; we owe it to the poor, beaten, hopeless world, to give you this chance.

"Come over here and sit down. I must tell you in a few words. I must persuade you."

She tugged at him; and, after a moment's hesitation, Craig allowed himself to be led towards a chair. Her voice was a melodious sound-force that did not even for an instant cease beating at him:

"I'm going to be up there with you. None of us will survive if you fail. That we resolved long ago.

"Lesley, here below ground is a marvelous machine shop. In a few minutes the greatest male scientists in our organization will be brought in one by one—and you can take their minds, their massive knowledge, and make it your own. I'm sorry you can't read the minds of women, because we have some wonderful women scientists. The whole of our Martian organization is built around the invention of Martha Eger—"

"Your *what* organization?" Craig gasped.

She seemed not to hear. She sat before him on the floor, looking up at him with eyes that were jewel bright and misty with the beginning of tears.

"Lesley, the world is a rotten mess. The United States has never recovered from the short-of-victory

peace treaty that ended World War II. Individual and national moralities are delicate structures capable of withstanding great strains, but easily warped. Every time a rich man's son or a nobleman's heir gain special advantages because of their birth, less favored individuals everywhere shrink a little deeper into their inferiority complexes, seek a little harder for escape from the destroying realities around them.

"That, of course, is minor. People are too busy for the most part to be aware of what they are reacting to. But in a parallel and greater fashion nations which have shed enormous quanties of blood for a cause cannot accept compromise. They must win or lose. Cynicism breeds too easily, moralities collapse in an astounding way when the side that is right sees the wrong 'getting away with it.' Weeds grow easily where flowers scintillated a single season before.

"Human science, so marvelously adaptive during the war, never recovered from the unsatisfactory peace. The whole earth stagnates today in a negative futility of ten thousand purposes, all of them doomed to frustration because there is no clear, unifying thread running through them.

"Jefferson Dayles' analysis of the world and the local situation is quite accurate. Men will vote women into power once. Within a few months they will want to plunge them back into a state of semiservility far worse than anything prevailing now. The trouble is that women are demanding extreme power. Always it is the extremists who dominate, without any great resistance from those who follow them.

"Oh, I admit *we* have done things. But man must work out his own destiny. Nothing in all human history is truer than that the race from which we have sprung cannot survive if, for instance, we furnish them with new inventions and our great science.

"But we're a backwater, an accident. The thirty-five of us—that includes you—can furnish a quart of blood a month to people of our blood type, and so give them youth, and so tie them to us with inhumanly strong bonds because at the end of thirty years they must again have the blood, or they die.

"Each of us can thus give life to some three hundred people. But it ends there. The rest of the human race is excluded. Altogether, eighteen children have been born to the twenty women among us, one of them yours and mine, but these had only a slightly greater toti-potent tendency than the average human being. Two gruesome experiments convinced us that toti-potency is not hereditary.

"So you see, we don't belong to the main stream of human struggle.

"But that doesn't mean we shouldn't try to help them, particularly when you consider that even the thirty-four failures among us have at least twice the average human brain capacity.

"Twenty times is possible. We know it is possible because some of

us attained a great degree of it during those gray unremembered months that make up a toti-potent period.

"Listen, here is my story, my little bit of evidence. I was born in 1896, became a nurse in the First World War, and had my right arm torn off by a high explosive shell.

"It was the mud that must have saved me from bleeding to death. For days I lay untended; and note this well: There is no record of anyone becoming toti-potent without such sustained pressure on them. A body given prompt medical attention does not become toti-potent.

"We have our people at all the medical information centers, and we get to a toti-potent case as soon as there is even a hint that such a case exists.

"But never mind that. My miracle is this: During my second phase I invented two little metal plates that, when fastened to the bottom of my shoes, enable me to walk on water.

"None of us know how those things work. We assume that I must have been in great danger from death by drowning, but we don't know even that. We can't duplicate them, although they appear to be constructed from the ordinary materials one might find aboard a ship.

"That is the real glory of it. This vast earth of ours, with its multitude of inventions apparently needs only a sharper mind to grasp at the facts that lie under our very eyes among the everyday things of life.

"Lesley, you know your task. Above ground you will find an assortment of machines. Engines, tools, electronic and electric instru-

ments, something of almost everything. Those dozen outbuildings are full of what seems to be junk but isn't.

"Look them over. Let your mind try to create new combinations of those old forms. And the moment you have something, communicate with the men down here. They'll build anything you want in a few hours.

"Lesley, what we want, what the world must have, is a leader. Our own experience, our own purposes tell us that there is nothing to fear from such a development.

"Lesley, you will either be that leader, or you will be Jefferson Dayles' puppet, and the remaining thirty-four of us will be dead, because we should consider ourselves of no further value. Do you understand?"

It seemed clear.

He kept awakening in a sweat of fear. Twice, lying in a half doze, he told himself he had dreamed his visit into the fortress under the ranchhouse.

But each time a grimmer realization was there to chide his mind for its illusions.

Funny how the day before, with the danger seeming remote, he had let his hopes dally between the half-conviction that they might actually be safe in this semiwinter resort—and a sense of deadly danger. The danger was correct.

An army, tanks, planes—and she and the others determined to die if he failed, if he was captured.

Craig jerked erect in bed. "Silly fool," he thought furiously, "they won't do that; and yet I lapped it up."

The rage subsided, because—

He liked the woman. She had fire and an absolutely intense personality; and somehow—it had nothing to do with love—he couldn't imagine her dead.

Besides, it wasn't only she or the other toti-potents.

There were the blood slaves of them all, the people down below, who would build the machines he planned, all of them his blood type, depending on him for their immortality. How beautifully clever it all was, and logical. They'd work like mad to carry out his plans.

And then there were the condemned killers. Odd to feel responsible for keeping *them* alive. Actually, of course they shouldn't have been sentenced to death. People might hate the idea, but members of a mob were not first-degree murderers.

His mind twisted its uneven course through the long night. Once a wonder came: this twenty times average capacity of the human brain—it couldn't be I. Q. Only a beam of pure radiant energy could have an I. Q. 2000.

There were other factors in the brain that might be affected. How was it, for instance, that a person with an I. Q. 100 so frequently had twice the personality and leadership qualities of some freak with an I. Q. 150.

No, the 20-brain wouldn't be I. Q. It would be—

He must have slept on the thought. When he woke up, it was still dark, but there was decision in him. He would try. He felt no different, no greatness, but he would try.

As dawn broke, Jefferson Dayles rose and stared through the eyeholes of his flesh mask out through the window of Mountainside Inn. It was the waiting, he thought. All

that he could do had been done. The orders, the intricate planning, the details of insuring that no escape avenues remained open—all that, he had attended to personally. And now others must do the work, while he paced helplessly to and fro in the confines of this small room—waiting.

The door behind him opened, but he did not turn.

The shadows lay heavy on the desert, but the mountains to the right were visible against the lightening sky. And to the left among the scatter of trees beyond the village, he could see the white tents of the awakening army.

Kay's voice came from behind him: "I've brought your breakfast."

He had forgotten that someone had come in. He jumped from the impact of the voice. And then smiled grimly at himself.

He turned, said: "Breakfast?"

He drank his orange juice; then, conscious that he was upset and therefore subject to acidity, took a tiny pinch of bicarbonate of soda. Then he went into the bathroom and brushed his teeth with water to counteract the orange juice.

The little teeth-protecting ceremony over, he remembered with a grimace that he had not even touched the kidney and toast and coffee.

He returned to the room, mustered a reasonable facsimile of his famous smile, and began to eat. Kay said:

"I'm pretty certain no one suspects your presence." She added after a moment: "We'll start in about an hour. It will require at least three hours to cover the forty miles over the sand. Some of our scouts penetrated to within a few hundred yards of the house during the night without being challenged. However, they obeyed orders and made no attempt to invade the yard."

Kay finished: I'm beginning to think our precautions have been ridiculous, but I agree that it's better to be safe than sorry. There is no longer any doubt. We must have this man before we can even *think* of a third term."

No answer. The automaton ate on. Four hours, Jefferson Dayles was thinking, four hours before he would know his fate.

VIII.

At the ranch, the chill of the desert night faded into a cold dawn, which slowly warmed that gray land. The men were up early. They ate breakfast almost in silence, offered no objections to Craig's statement about the prisoner, and finally dispersed. Some went out to relieve the night watchers on the peaks that topped the gashed hills and uneven sand plains. Only one or two actually seemed busy.

The atmosphere was tense, nervous, expectant. As they closed the door of the third outhouse, Anrella said frowningly:

"I certainly expected the men to object when you said that I would accompany you wherever you went

today. It must have puzzled them."

Craig was silent. The mantle of leadership that had been yielded him puzzled him too. Several times he had caught the beginning of opposition in the minds of the men, only to watch it fade away without being given expression. He grew aware that Anrella was speaking again, uneasily:

"I wish I hadn't advised you to go back to sleep. We wanted you to be fresh for your task. But we also wanted to time everything so that you would have at least half a day."

Curiously, just like that, her words irritated him. He shook himself, then said sharply:

"My means to success are too limited. And I have a conviction I'm approaching this whole subject from the wrong angle. It's the mechanical slant that's not right. I could see several possibilities, for instance, in the electrical equipment in that last outhouse. The use of the 999 plus vacuum offers several opportunities when conjuncted with electric coils but—"

He stared at her darkly. "There is one fatal flaw in them all. They kill. They burn and destroy. Frankly, I'll be hanged before I murder a bunch of poor benighted soldiers. And I might as well tell you right now I'm getting fed up."

"This whole business"—he waved an arm impotently—"is too silly for words. I'm beginning to wonder if I'm in my right mind."

He scowled at her angrily. "Let me ask you a question: "Is it possible for you to have a spaceship here in a short time, and pick us all up, and so save the lives of everyone above ground here?"

Anrella's gaze was quiet, her manner tranquil. "It's even simpler than that. We could take you below ground. But the spaceship is available too. There's one about twenty miles above us, a large model of what you used to think was an electric plane. I could call it down right now. But I won't. This is the critical moment in a plan we have been maturing ever since we first found you."

Craig snapped: "I don't believe your threat about killing yourselves. That's merely another pressure trick."

Anrella said softly: "You're tired, Lesley, and under great physical strain. I swear on my word of honor that what I have told you is the truth."

"What's ordinary honor to a superwoman?"

She was calm. "If you'll think about the implications of your refusal to kill the people who are coming to attack us, you will realize that what makes everything we do so right is that our intentions *are* honorable. And Lesley—

"Lesley, I'm going to tell you something I hadn't intended to. One of the two children with whom we experimented was—ours. Selection was by lot and—they cut off one of his legs, and left him to become toti-potent. But instead he died.

"The other one died too. The reason we tried was because

Martha Eger's grandson returned from the war toti-potent. It seemed to suggest, and actually it proved, higher potentiality, but—we know now it isn't enough. Just as our blood will rejuvenate, yet not 'start' the recipient's innate toti-potency.

"Lesley, I'll be eighty years old this year. Physically, of course, I don't feel it, but mentally I do. And so do the others. Seventeen of them are older than I am, twelve about the same. It's strange that so few toti-potents came out of the last war; perhaps the medical services were better . . . but never mind that.

"All of us have seen a lot, thought a lot. And we feel with absolute sincerity that we can only be a hindrance to the human race unless we can somehow influence them along the paths of progress. To that end, we must have stronger, abler leadership than anything we have so far managed ourselves. We—"

There was a tiny *ting* from her magic jewel wrist radio. She lifted it, so that he could hear, too. A small but clear voice came:

"A column of armored cars and several tanks are streaming along the road that leads to Arroyo Pass ten miles south of Mountainside. A number of planes have been passing over here since dawn. If you haven't seen them, it must mean they're keeping out of sight of the ranch. That is all."

The minute *ting* repeated. And there was silence.

Anrella broke it in a strained voice: "I think," she said, "I think, Lesley, we had better get back to realities."

The shock grew. It wasn't the child, Craig told himself. That was too vague, although he caught himself in horrible visualization of the fate of those two wretched children.

The picture brought conviction. Quite suddenly he believed. Before he could speak, Anrella said anxiously:

"The important thing, I'm beginning to think, is some preliminary weapon that will hold off land armies, and give you time to develop a major invention. We won't have to worry about aerial bombing, because the last thing Jefferson Dayles desires is your destruction."

She hesitated. "What about that disintegrating ray, which affects only inorganic matter?" Her blue eyes gave him a quick, questioning glance. "We're willing to supply the wire to the nearest electric plug just as we did in the jail. Or even a mobile power plant."

Once more she hesitated; then: "It would destroy their tanks, armored cars and would strip them to their birthday suits." She laughed nervously. "That would disorganize almost any army now in existence."

Craig shook his head. "I examined it just before breakfast. And it's no go. It's complete as is. I could reduce it to the size of a hand weapon, and retain the same power.

But an increase in bulk would add no energy. It all depends on one tube that—"

He shrugged. "All they have to do is verify that I'm not manning it, then keep their artillery beyond its quarter-mile range, and probe with high explosives. It's possible" —he smiled savagely—"that one of the men would rather die that way than in a gas chamber. But you can see it's no solution. I— What are you doing, Haines?"

They had come to where a well-set, unshaven young man was working on the engine of a car. The hood was up; and he was standing with one of the spark plugs in his fingers, brushing at its points.

Actually, Craig's question was unnecessary. Clearly delineated in the man's mind was the intention to get the engine working, and leave the ranch.

Dan Haines was a bit-part actor, whose only reason for participating in the parade attack had been, as he had stated sullenly to the court, that he couldn't stand "a world run by women" and that he had "got excited." And also that he was ready to take "what was coming to him."

He had added nothing to the escape except the burden of his jittery presence.

And now, in a jump of apprehension, his nerve had broken. He looked up guiltily. "Oh!" he said, as he saw Anrella. Then, more casually: "Just fixing the bus. I want us to be able to make a run for it if we have to."

Craig stepped past him, and stared down curiously at the exposed engine. In his mind's eye, he was visualizing the whole machine, first as a unit, then each separate function in detail.

It was a lightning examination, and purely mental—engine—battery—ignition—clutch—generator. He paused there, and went back: battery—

He said slowly: "What would happen, Haines, if all the power of a battery was discharged in a millionth of a second?"

"Huh!" said Haines blankly. "That couldn't happen."

"It would," said Craig, "if the zinc plate is electrically pre-hardened and if you use a pentagrid shielding tube, the type of tube that is used to control unwanted power. It—"

He stopped, dazzled. Because—Good God!—here was a temporary answer. The details stood sharp and clear in his mind. He made a mental calculation, and then, looking up, saw Anrella's shining eyes on him.

After a moment, her gaze darkened. She said hesitantly: "I think I see what you're getting at. But wouldn't the temperature be too great? The figures I get are—unbelievable."

"We can use a miniature battery," Craig said quickly, "not a full-sized one. After all, it's merely the percussion cap. The reason the temperature would be so high is that in the interior of a sun, there is no control tube, and so the right environment occurs only

here and there through space, and we have a Nova-O sun.

"With a normal-sized battery, the temperature would be too high. But I think we could strip off the four most dangerous oughts by using a small short-lived dry cell, and so be safe."

He turned away, frowning. Then paused, turned. *"Don't* leave, Haines. Stay right here on the ranch."

"Yes, Mr. Craig."

Craig walked off thoughtfully; and then once more he stopped. "What," he thought, "was it the young man had said?"

Wide-eyed, he whirled and stared at Haines. The man had turned his back, but every mental contour of his brain was exposed. Craig stood there, comparing, remembering; and finally, satisfied, he faced Anrella, said quietly:

"Let your people work on that at top speed. And work out too some refrigeration system for the ranch-house. I think the battery should be buried about ten feet in the sand three or four miles south of here. And I don't see why it should take longer than three quarters of an hour. As for you and me—"

He stared at her sardonically. "Order the spaceship down. We're going to Mountainside."

"We're what?" She looked at him, suddenly white. "Lesley, you know that doesn't follow logically out of this invention."

He made no answer, simply stared at her; and after a moment she faltered:

"This is all wrong. I s-shouldn't do it. I—"

She shook her head, bewildered. Then without further protest, lifted her wrist radio.

By eight o'clock, the old-timers were gathered on the porch at Mountainside Inn. Craig could see them looking slant-eyed at Anrella and himself and at the dozen very obvious secret service women who lounged in various positions around the door.

The oldsters of Mountainside were not accustomed to having strangers intrude upon their privacy. But a danged lot of things had been happening lately. Their minds showed a mixture of excitement and irritation. Their conversation had a numbed quality.

It was about ten minutes after eight when one of them wiped the perspiration from his forehead, and trotted to the thermometer beside the door.

He came back. "Ninety-eight," he announced to his cronies. "Derned warm for Mountainside in February."

There was a brief, animated discussion on past heat records for the month. The cracked voices sagged slowly into an uncomfortable silence, as the hot breeze from the desert blew stronger.

Once more an old-timer ambled to the thermometer. He came back, shaking his head.

"Hundred and five," he said. "And it's only twenty-five minutes after eight. Looks like its gonna be a scorcher."

Before Anrella could more than look startled, Craig walked over. "I'm a doctor," he said. "And sudden changes in temperature like this are pretty hard on older men. Go up to Mountain Lake. Make a day of it, a holiday. But go!"

When he came back to Anrella, they were already streaming off the veranda. They roared by a few minutes later in two old sedans. Anrella frowned at Craig.

"The psychology of that was all wrong. Old desert rats don't usually accept the advice of younger men."

"They're not desert rats," said Craig. "They're lungers. And to them a doctor is god." He smiled and added: "Let's walk along the street a bit. I saw an old woman in a house there, who ought to be advised to get into the hills."

The old woman was easily persuaded by a doctor to take a picnic. She loaded some canned goods into a wheezy old car, and was off in a swirl of dust.

There was a meteorological station in a little white building fifty feet farther on. Craig opened the door and called to the perspiring creature inside:

"What's the temperature now?"

The plump, bespectacled man dragged himself over to the desk.

"It's 120," he moaned. ". . . Nightmare. . . . The offices at Denver and Los Angeles are burning the wires asking me if I'm drunk. "But"—he grimaced—"they'd better start re-drawing their isobars, and warn their population. By tonight the storm winds will be raising the seats of their pants."

Outside again, Anrella said wearily:

"Lesley, please tell me what all this is about. If it gets any warmer, our flesh masks will float away on a river of perspiration."

Craig laughed grimly. It was going to be warmer all right. He felt a sudden awe. A pinpoint of heat—he pictured it out there to the burning south—flashing eighteen thousand billion degrees Fahrenheit for one millionth of a second. The temperature here in Mountainside should go up to at least 135, and where the armored force was . . . 145 . . . 150.

It wouldn't kill. But unless they weren't made of human flesh, that army would turn back, and race for the cool hills.

It was hotter, as they headed back to the inn. And there were other cars moving towards the mountain highway, a long line of them. The heat shimmered above the sand and against the gray hillsides. There was a dry, baked scent in the air, a stifling odor, actually painful to the lungs. Anrella said unhappily:

"Lesley, are you sure you know what you're doing?"

"It's very simple," Craig nodded brightly. "I consider we've got the equivalent of a good, roaring forest fire here. If you've ever seen a forest fire, and several of my memories include knowledge on the subject, you'll know that they flush every type of game from cover. There is a mad rush towards cooler territories. Even the

king of beasts condescends to run before such a conflagration.

"My guess was that we'd find a king here and"—he finished smugly —"there he is now, out in the open, where I can make absolutely sure with a minimum of danger that I'm not fooling myself."

Craig nodded towards the inn door, from which a well-built man was emerging onto the veranda. The man's face was that of a very ordinary middle-aged American, but his voice when he spoke was the commanding resonant voice of Jefferson Dayles.

"Haven't you got those motors going yet?" he asked irritably. "It seems strange, two cars getting out of order at the same moment."

There were mumbled exclamations of apology, and something about another car being along in a few minutes from the camp. Craig smiled, and whispered to Anrella:

"I see the pilot of your spaceship is still pouring down the interfering rays. O. K. Go ahead and issue the invitation."

"But he won't come. I'm sure he won't."

"If he doesn't come, it will mean I've been kidding myself, and we'll head straight back to the ranch."

"Kidding yourself about what? Lesley, this is life and death for us."

Craig looked at her. "What's this?" he mocked. "You don't like pressure. Maybe it will double your I. Q."

Without a word, she climbed the veranda steps. He heard her disguised voice uttering the necessary words; as she finished, Craig called:

"Yes, come! Your cars can follow."

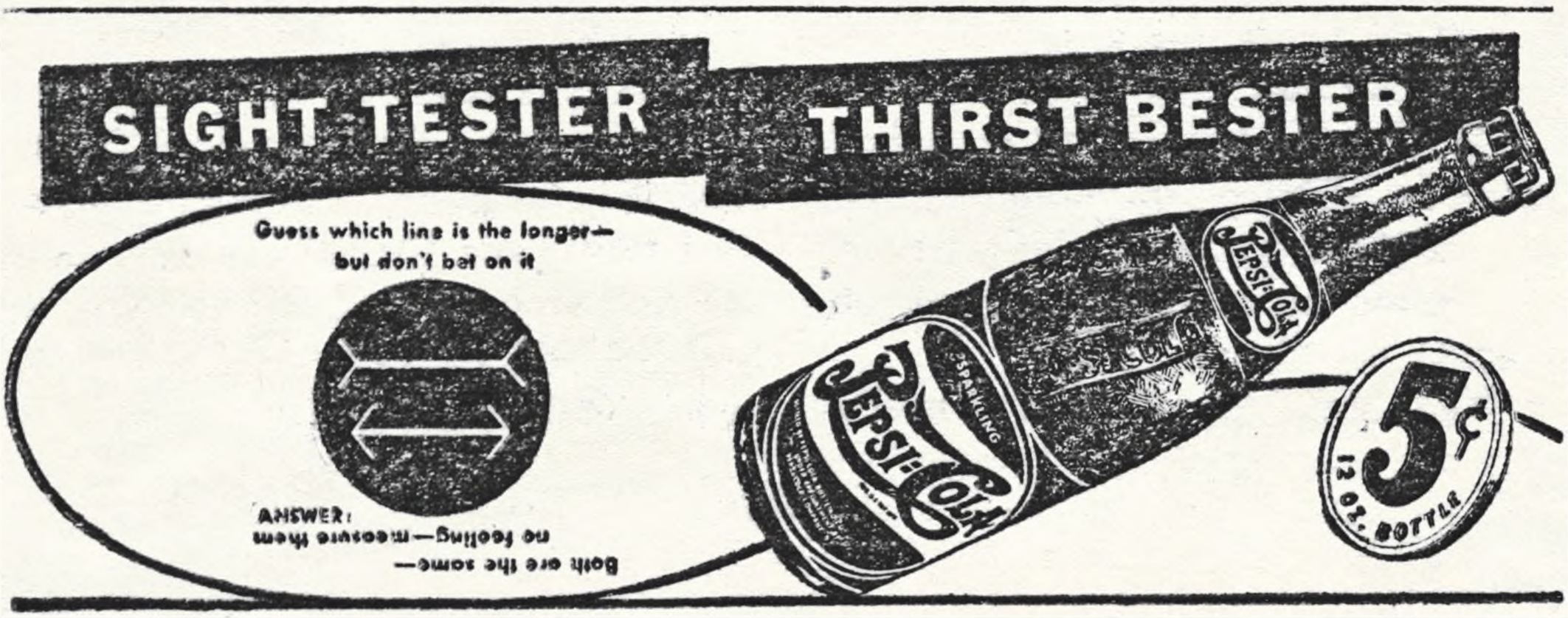
The president and three secret agents followed Anrella down the steps. Anrella said steadily:

"Do you think we can take four altogether?"

"Oh, sure," said Craig. "Squeeze one in front here with us."

A minute later, the car was in medium gear, and purring up the first grade.

Craig said loudly: "You know, darling, I've been thinking about the Equalized women who make up the private army of President Dayles. The drug they took can be neutralized by a second dose, the chemical



structure of which varies slightly from the original. The crystalline manganese element in the drug as it now is, is tied to the compound by four bars. That's unstable. By removing two of the bars, and I know just how it can be done, the connection will be stiffened. This will—"

He broke off, as, from the corner of his eye, he saw the strained look on Anrella's face. From the rear seat, Jefferson Dayles said dryly:

"Are you a chemist, Mr.— I didn't get the name."

"Craig," said Craig amiably. "Lesley Craig." He went on: "No, not a chemist. You can call me a sort of universal solvent. You see, I have discovered that I have a curious quality of the mind. I—"

He paused. In the rear-view mirror, he saw the guns that the two agents in the back seat had drawn. Jefferson Dayles' voice came steadily:

"Go on, Mr. Craig."

"It is my determination," Craig said, "that President Dayles shall realize his ambitions; rejuvenation and continuation in the presidency until there has been some re-integration of national and international morality on a much higher level than has ever prevailed.

"I favor, too, a progressively greater sharing of administrative power with women. This will require an educational program designed to—"

The stricken look on Anrella's face brought his first qualm of pity. But there was no such thing as explaining in the presence of others.

Haines instant acceptance of his command had provided the clue. The rest—memory of how every command or determination he had expressed had been immediately acquiesced in—was confirmatory evidence. First, Peters bringing his clothes, and only afterwards questioning the act. Later, Anrella handing over the gun, and ordering the spaceship down, and the old men and old woman going into the mountains—proved both men and women were subject.

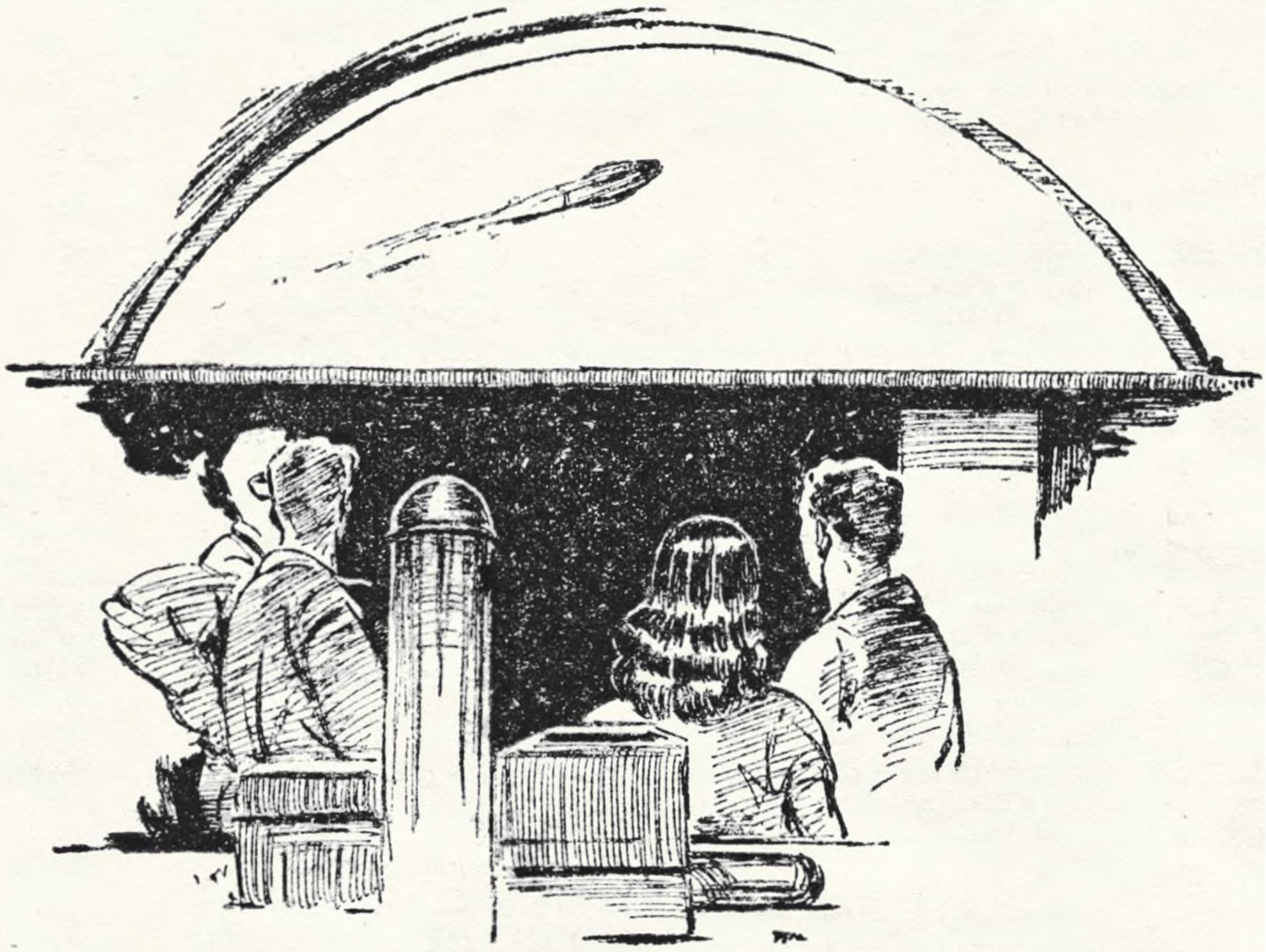
It had nothing to do with the conscious mind. Not once had there been awareness. It went deeper. It affected some great basic in the brain. It must seem to the obedient ones—their own logic.

An important angle, that last. Later, he would tell Anrella; now—there were commands to give that must sound like suggestions. He must make sure, for instance, that the army was recalled from its hell. Insure also that the agents put away their guns. And prepare for the storms that would be blowing down from the mountains to balance an unnatural cataclysm of weather.

Instant by instant, the future seemed brighter, more promising.

Craig gave the necessary orders as the car bowled down into a brief valley, and then up into the high, cool, sweet hills beyond.

THE END.



The Long Way

by GEORGE O. SMITH

When a law is man-made, a lawyer can play tricks with it; when the law is Nature's, an engineer holds trumps. But when the two meet in a patent —there's some question whether the engincer or the lawyer gets the prize.

Illustrated by Kramer

Don Channing stood back and admired his latest acquisition with all of the fervency of a high school girl inspecting her first party dress. It was so apparent, this affection between man and gadget, that the workmen who were now carrying off the remnants of the packing case did so from the far side of the bench so that they would not come between the director of communications and the object of his affection. So intent was Channing in his adoration of the object that he did not hear the door open, nor the click of high heels against the plas-

tic flooring. He was completely unaware of his surroundings until Arden said:

"Don, what off earth is that?"

"Ain't she a beaut?" breathed Channing.

"Jilted for a jimcrank," groaned Arden. "Tell me, my quondam husband, what is it?"

"Huh?" asked Don, coming to life once more.

"In plain, unvarnished words of one cylinder, what is that . . . that, *that?*"

"Oh, you mean the transmission tube?"

"How do you do?" said Arden to the big tube. "Funny-looking thing, not like any transmitting tube I've ever seen before."

"Not a transmitting tube," explained Channing. "It is one of those power transmission tubes that Baler and Carroll found on the Martian desert."

"I presume that is why the etch says: 'Made by Terran Electric, Chicago'?"

Channing laughed. "Not one found—there was only one found. This is a carbon copy. They are going to revolutionize the transmission of power with 'em."

"Funny-looking gadget."

"Not so funny. Just alien."

"Know anything about it?"

"Not too much. But I've got Barney Carroll coming out here and a couple of guys from Terran Electric. I'm going to strain myself to keep from tinkering with the thing until they get here."

"Can't you go ahead? It's not like you to wait."

"I know," said Channing. "But the Terran Electric boys have sewed up the rights to this dinkus so tight that it is squeaking. Seems to be some objection to working on them in the absence of their men."

"Why?"

"Probably because Terran Electric knows a good thing when they see it. Barney's latest 'gram said that they were very reluctant to rent this tube to us. Legally they couldn't refuse, but they know darned well that we're not going to run power in here from Terra—or anywhere else. They know we want it for experimentation, and they feel that it is their tube and that if any experimentation is going to take place, they're going to do it."

The workmen returned with two smaller cases; one of each they placed on benches to either side of the big tube. They knocked the boxes apart and there emerged two smaller editions of the center tube—and even Arden could see that these two were quite like the forward half and the latter half, respectively, of the larger tube.

"Did you buy 'em out?" she asked.

"No," said Don simply. "This merely makes a complete circuit."

"Explain that one, please."

"Sure. This one on the left is the input-terminal tube which they call the power-end. The good old D. C. goes in across these two terminals. It emerges from the big end, here, and bats across in a beam of intangible something-or-other until it gets to the relay tube where it is

once more tossed across to the load-end tube. The power is taken from these terminals on the back end of the load-end tube and is then suitable for running motors, refrigerators, and so on. The total line-loss is slightly more than the old-fashioned transmission line. The cathode-dynode requires replacement about once a year. The advantages over high-tension wires are many; in spite of the slightly higher line-losses and the replacement trick, they are replacing long-lines everywhere.

"When they're properly aligned, they will scat right through a mountain of solid iron without attenuation. It takes one tower every hundred and seventy miles, and the only restriction on tower height is that the tube must be above ground by ten to one the distance that could be flashed over under high intensity ultraviolet light."

"That isn't clear to me."

"Well, high tension juice will flash over better under ultraviolet illumination. The tube must be high enough to exceed this distance by ten to one at the operating voltage of the stuff down the line. Another thing, the darned beam can be made to curve by adjusting the beam plates in the tube. The boys in the Palanortis Jungles say they're a godsend, since there are a lot of places where the high-tension towers would be impossible since the Palanortis Whitewood grows about a thousand feet tall."

"You'd cut a lot of wood to ream a path through from Northern Landing to the power station on the Boiling River," said Arden.

"Yeah," drawled Don, "and towers a couple of hundred miles apart are better than two thousand feet. Yeah, these things are the nuts for getting power shipped across country."

"Couldn't we squirt it out from Terra?" asked Arden. "That would take the curse off of our operating expenses."

"It sure would," agreed Channing heartily. "But think of the trouble in aligning a beam of that distance. I don't know—there's this two hundred mile restriction, you know. They don't transmit worth a hoot over that distance, and it would be utterly impossible to maintain stations in space a couple of hundred miles apart, even from Venus, from which we maintain a fairly close tolerance. We might try a hooting big one, but the trouble is that misalignment of the things results in terrible effects."

The door opened and Charley Thomas and Walt Franks entered.

"How's our playthings?" asked Walt.

"Cockeyed looking gadgets," commented Charley.

"Take a good look at 'em," said Channing. "Might make some working X-ray plates, too. It was a lucky day that these got here before the boys from Terran Electric. I doubt that they'd permit that."

"O. K.," said Charley. "I'll bring the X-ray up here and make some pix. You'll want working prints; Walton will have to take 'em and hang dimensions on to fit."

"And we," said Channing to Walt Franks, "will go to our respective offices and wait until the Terran Electric representatives get here."

The ship that came with the tubes took off from the landing stage, and as it passed their observation dome, it caught Don's eye. "There goes our project for the week," he said.

"Huh?" asked Walt.

"He's been like that ever since we tracked him down with the *Relay Girl,*" said Arden.

"I mean the detection of driver radiation," said Channing.

"Project for the week?" asked Walt. "Brother, we've been tinkering with that idea for months, now."

"Well," said Don, "there goes four drivers, all batting out umpty-ump begawatts of something. They can hang a couple of G on a six-hundred foot hull for hours and hours. The radiation they emit must be detectable; don't tell me that such power is not."

"The interplanetary companies have been tinkering with drivers for years and years," said Walt. "They have never detected it?"

"Could be, but there are a couple of facts that I'd like to point out. One is that they're not interested in detection. They only want the best in driver efficiency. Another thing is that the radiation from the drivers is sufficient to ionize atmosphere into a dull red glow that persists for several minutes. Next item is the fact that we on Venus Equilateral should be able to invent a detector; we've been tinkering with detectors long enough. Oh, I'll admit that it is secondary-electronics—"

"Huh? That's a new one on me."

"It isn't electronics," said Channing. "It's subetheric or something like that. We'll call it sub-electronics for lack of anything else. But we should be able to detect it somehow."

"Suppose there is nothing to detect?"

"That smacks of one hundred percent efficiency," laughed Don. "Impossible."

"How about an electric heater?" asked Arden.

"Oh Lord, Arden, an electric heater is the most ineffic—"

"Is it?" interrupted Arden with a smile. "What happens to radiation when intercepted?"

"Turns to heat, of course."

"That takes care of the radiation output," said Arden. "Now, how about electrical losses?"

"Also heat."

"Then everything that goes into an electric heater emerges as heat," said Arden.

"I get it," laughed Walt. "Efficiency depends upon what you hope to get. If what you're wanting is losses, anything that is a total loss is one hundred percent efficient. Set your machine up to waste power and it becomes one hundred percent efficient as long as there is nothing coming from the machine that doesn't count as waste."

"Fine point for argument," smiled Channing. "But anything that will make atmosphere glow that dull red after the passage of a

ship will have enough waste to detect. Don't tell me that the red glow enhances the drive."

The door opened again and Charley came in with a crew of men. They ignored the three, and started to hang heavy cloth around the walls and ceiling. Charley watched the installation of the barrier-cloth and then said: "Beat it—if you want any young Channings!"

Arden, at least, had the grace to blush.

The tall, slender man handed Don an envelope full of credentials. "I'm Wesley Farrell," he said. "Glad to have a chance to work out here with you fellows."

"Glad to have you," said Don. He looked at the other man.

"This is Mark Kingman."

"How do you do?" said Channing. Kingman did not impress Channing as being a person whose presence in a gathering would be demanded with gracious shouts of glee.

"Mr. Kingman is an attorney for Terran Electric," explained Wesley.

Kingman's pedestal was lowered by Channing.

"My purpose," said Kingman, "is to represent my company's interest in the transmission tube."

"In what way?" asked Don.

"Messrs. Baler and Carroll sold their discovery to Terran Electric outright. We have an iron-bound patent on the device and/or any developments of the device. We hold absolute control over the transmission tube, and therefore may dictate all terms on which it is to be used."

"I understand. You know, of course, that our interest in the transmission tube is purely academic."

"I have been told that. We're not too certain that we approve. Our laboratories are capable of any investigation you may desire, and we prefer that such investigations be conducted under our supervision."

"We are not going to encroach on your power rights," explained Channing.

"Naturally," said Kingman in a parsimonious manner. "But should you develop a new use for the device, we shall have to demand that we have complete rights."

"Isn't that a bit high-handed?" asked Don.

"We think not. It is our right."

"You're trained technically?" asked Don.

"Not at all. I am a lawyer, not an engineer. Mr. Farrell will take care of the technical aspects of the device."

"And in looking out for your interests, what will you require?"

"Daily reports from your group. Daily conferences with your legal department. These reports should be prepared prior to the day's work so that I may discuss with the legal department the right of Terran Electric to permit or to disapprove the acts."

"You understand that there may be a lot of times when something discovered at ten o'clock may

change the entire program by ten oh six?"

"That may be," said Kingman, "but my original statements must be adhered to, otherwise I am authorized to remove the devices from your possession. I will go this far, however; if you discover something that will change your program for the day, I will then call an immediate conference which should hurry your program instead of waiting until the following morning for the decision."

"Thanks," said Channing dryly. "First, may we take X-ray prints of the devices?"

"No. Terran Electric will furnish you with blueprints which we consider suitable." Kingman paused for a moment. "I shall expect the complete program of tomorrow's experiments by five o'clock this evening."

Kingman left, and Wes Farrell smiled uncertainly. "Shall we begin making the list?"

"Might as well," said Channing. "But, how do you lay out a complete experimental program for twelve hours ahead?"

"It's a new one on me, too," said Farrell.

"Well, come on. I'll get Walt Franks, and we'll begin."

"I wonder if it might not be desirable for Kingman to sit in on these program-settings?" said Channing, after a moment of staring at the page before him.

"I suggested that to him. He said 'No'. He prefers his information in writing."

Walt came in on the last words. Channing brought Franks up to date and Walt said: "But why would he want a written program if he's going to disallow certain ideas?"

"Sounds to me like he's perfectly willing to let us suggest certain lines of endeavor; he may decide that they look good enough to have the Terran Electric labs try themselves," said Channing.

Wes Farrell looked uncomfortable.

"I have half a notion to toss him out," Channing told Farrell. "I also have half a notion to make miniatures of this tube and go ahead and work regardless of Kingman or Terran Electric. O. K., Wes, we won't do anything illegal. We'll begin by making our list."

"What is your intention? asked Wes.

"We hope that these tubes will enable us to detect driver-radiation, which will ultimately permit us to open ship-to-ship two-way communication."

"May I ask how you hope to do this?"

"Sure. We're going to cut and try. No one knows a thing about the level of driver-energy; we've assigned a selected name for it: Subelectronics. The driver tube is akin to this transmission tube, if what I've been able to collect on the subject is authentic. By using the transmission tube—"

"Your belief is interesting. I've failed to see any connection between our tube and the driver tube."

"Oh sure," said Channing expansively. "I'll admit that the similarity is of the same order as the similarity between an incandescent lamp and a ten dynode, electron-multiplier such as we use in our final beam stages. But recall this business of the cathode-dynode. In both, the emitting surface is bombarded by electrons from electron guns. They both require changing."

"I know that, but the driver cathode disintegrates at a rate of loss that is terrific compared to the loss of emitting surface in the transmission tube."

"The driver cathode is worth about two hundred G-hours. But remember, there is no input to the driver such as you have in the transmission tube. The power from the driver comes from the disintegration of the cathode surface—there isn't a ten thousandth of an inch of plating on the inside of the tube to show where it went. But the transmission tube has an input and the tube itself merely transduces this power to some level of radiation for transmission. It is re-transduced again for use. But the thing is this: Your tube is the only thing we know of that will accept subelectronic energy and use it. If the driver and the transmission tubes are similar in operational spectrum, we may be able to detect driver radiation by some modification."

"That sounds interesting," said Wes. "I'll be darned glad to give you a lift."

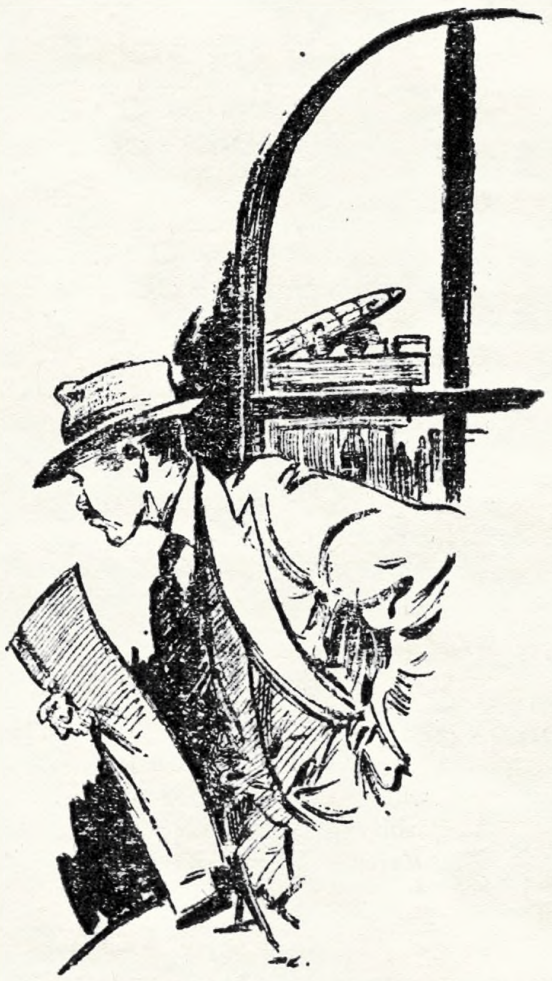
"Isn't that beyond your job?" asked Channing.

"Yeah," drawled Farrell, "but could you stand by and watch me work on a beam transmitter?"

"No—"

"Then don't expect me to watch without getting my fingers dirty," said Farrell cheerfully. "Sitting around in a place like this would drive me nuts without something to do."

"O. K., then," smiled Don. "We'll start off by building about a dozen miniatures. We'll make 'em about six inches long—we're not going to handle much power, you know. That's first."



Kingman viewed the list with distaste. "There are a number of items here which I may not allow," he said.

"For instance?" asked Channing with lifted eyebrows.

"One, the manufacture or fabrication of power transmission tubes by anyone except Terran Electric is forbidden. Two, your purpose in wanting to make tubes is not clearly set forth. Three, the circuits in which you intend to use these tubes is unorthodox, and must be clearly and fully drawn and listed."

"Oh spinach! How can we list and draw a circuit that is still in the embyronic stage?"

"Then clarify it. Until then I shall withhold permission."

"But look, Mr. Kingman, we're going to develop this circuit as we go along."

"You mean that you are going to fumble your way through this investigation?"

"We do not consider a cut-and-try program as fumbling," said Walt Franks.

"I am beginning to believe that your research department has not the ability to reduce your problems to a precise science," said Kingman scornfully.

"Name me a precise science," snapped Channing, "or even a precise art!"

"The legal trade is as precise as any. Everything we do is done according to legal precedent."

"I see. And when there is no precedent?"

"Then we all decide upon the proper course, and establish a precedent."

"But I've got to show you a complete circuit before you'll permit me to go ahead?"

"That's not all. Your program must not include reproducing these tubes either in miniature or full size—or larger. Give me your requirements and I shall request Terran Electric to perform the fabrication—"

"Look, Kingman, Venus Equilateral has facilities to build as good a tube as Terran Electric. I might even say better, since our business includes the use, maintenance, and development of radio tubes; your tubes are not too different from ours. Plus the fact that we can whack out six in one day, whilst it will take seventy-three hours to get 'em here after they're built on Terra."

"I'm sorry, but the legal meaning of the patent is clear. Where is your legal department?"

"We have three. One on each of the Inner Planets."

"I'll request you to have a legal representative come to the Station so that I may confer with him. One with power of attorney to act for you."

"Sorry," said Channing coldly. "I wouldn't permit any attorney to act without my supervision."

"That's rather a backward attitude," said Kingman. "I shall still insist on conducting my business with one of legal mind."

"O. K. We'll have Peterman come out from Terra. But he'll still be under my supervision."

"As you wish. I may still exert my prerogative and remove the tubes from your possession."

"You may find that hard to do," said Channing.

"That's illegal!"

"Oh no, it won't be. You may enter the laboratory at any time and remove the tubes. Of course, if you are without technical training you may find it most difficult to disconnect the tubes without getting across a few thousand volts. That might be uncomfortable."

"Are you threatening me?" said Kingman, bristling. His stocky frame didn't take to bristling very well, and he lost considerable prestige in the act.

"Not at all. I'm just issuing a fair warning that the signs that say: DANGER! HIGH VOLTAGE! are not there for appearance."

"Sounds like a threat to me."

"Have I threatened you? It sounds to me as though I were more than anxious for your welfare. Any threat of which you speak is utterly without grounds, and is a figment of your imagination; based upon distrust of the Interplanetary Communications Company, and the personnel of the Venus Equilateral Relay Station."

Kingman shut up. He went down the list, marking off items here and there. While he was marking, Channing scribbled a circuit and listed the parts. He handed it over as Kingman finished.

"This is your circuit?" asked the lawyer skeptically.

"Yes."

"I shall have to ask for an explanation of the symbols involved."

"I shall be happy to present you with a book on essential radio technique," offered Channing. "A perusal of which will place you in possession of considerable knowledge. Will that suffice?"

"I believe so. I can not understand how; being uncertain of your steps a few minutes ago, you are now presenting me with a circuit of your intended experiment."

"The circuit is, of course, merely symbolic. We shall change many of the constants before the day is over—in fact, we may even change the circuit."

"I shall require a notice before each change so that I may pass upon the legal aspects."

"Walt," said Don, "will you accompany me to a transparency experiment on the Ninth Level?"

"Be more than glad to," said Walt. "Let's go!"

They left the office quickly, and started for Joe's. They had not reached the combined liquor-vending and restaurant establishment when the communicator called for Channing. It was announcing the arrival of Barney Carroll, so instead of heading for Joe's, they went to the landing stage at the south end of the Station to greet the visitor.

"Barney," said Don, "of all the companies, why did you pick on Terran Electric?"

"Gave us the best deal," said the huge, grinning man.

"Yeah, and they're getting the best of my goat right now."

"Well, Jim and I couldn't handle anything as big as the power transmission set-up. They paid out a large slice of jack for the complete rights. All of us are well paid now. After all, I'm primarily interested in Martian artifacts, you know."

"I wonder if they had lawyers," smiled Walt wryly.

"Probably. And, no doubt, the legals had a lot to do with the fall of the Martian Civilization."

"As it will probably get this one so bound up with red tape that progress will be impossible—or impractical."

"Well, Barney, let's take a run up to the lab. We can make paper-talk even if Brother Kingman won't let us set it to soldering iron. There are a lot of things I want to ask you about the tube."

They sat around a drawing table and Channing began to sketch. "What I'd hoped to do is this," he said, drawing a schematic diagram. "We're not interested in power transmission, but your gadget will do a bit of voltage amplification because of its utter indifference to the power-line problem of impedance matching. We can take a relay tube and put in ten watts, say, across ten thousand ohms. That means the input will be somewhat above three hundred volts. Now, if our output is raced across a hundred thousand ohms, ten watts will give us one thousand volts. So we can get voltage amplification at the expense of current—which we will not need. Unfortunately, the relay tube as well as the rest of the system will give out with the same kind of power that it is impressed with—so we'll have amplification of driver radiation. Then we'll need a detector. We haven't been able to get either yet, but this is a start, providing that Terran Electric will permit us to take a deep breath without wanting to pass on it."

"I think you may be able to get amplification," said Barney. "But to do it, you'll have to detect it first."

"Huh?"

"Sure. Before these darned things will work, this in-phase anode must be right on the beam. That means that you'll require a feed-back circuit from the final stage to feed the in-phase anodes. Could be done without detection, I suppose."

"Well, for one thing, we're going to get some amplification if we change the primary anode—so. That won't permit the thing to handle any power, but it will isolate the output from the input and permit more amplification. Follow?"

"Can we try it?"

"As soon as I get Terran Electric's permission."

"Here we go again!" groaned Walt.

"Yeah," said Don to Barney, "now you'll see the kind of birds you sold your gadget to."

They found Kingman and Farrell in conference. Channing offered his suggestion immediately,

and Kingman looked it over, shaking his head.

"It is not permitted to alter, change, rework, or repair tubes owned by Terran Electric," he said.

"What are we permitted to do?" asked Channing.

"Give me your recommendation and I shall have the shop at Terran Electric perform the operation."

"At cost?"

"Cost plus a slight profit. Terran Electric, just as Communications, is not in business from an altruistic standpoint."

"I see."

"Also," said Kingman severely, "I noticed one of your men changing the circuit slightly without permission. Why?"

"Who was it?"

"The man known as Thomas."

"Charley Thomas is in charge of development work," said Channing. "He probably noticed some slight effect that he wanted to check."

"He should have notified me first—I don't care how minute the change. I must pass on changes first."

"But you wouldn't know their worth," objected Barney.

"No, but Mr. Farrell does, and will so advise me."

Wes looked at Channing. "Have you been to the Ninth Level yet?"

"Nope," said Channing.

"May I accompany you?"

Channing looked at Farrell critically. The Terran Electric engineer seemed sincere, and the pained expression on his face looked like frustrated sympathy to Don. "Come along," he said.

Barney smiled cheerfully at the sign on Joe's door. "That's a good one, 'Best Bar in Twenty-seven Million Miles, Minimum!' What's the qualification for?"

"That's about as close as Terra gets. Most of the time the nearest bar is at Northern Landing, Venus; sixty-seven million miles from here. Come on in and we'll get plastered."

Farrell said: "Look, fellows, I know how you feel. They didn't tell me that you weren't going to be given permission to work. I understood that I was to sort of walk along, offer suggestions, and sort of prepare myself to take over some research myself. This is sickening."

"I think you mean that."

"May I use your telephone. I want to resign."

"Wait a minute. If you're that sincere, why don't we outguess 'em?"

"Could do," said Wes. "How?"

"Is there any reason why we can't take a poke to Sol himself?"

"You mean haul power out of the sun?"

"That's the general idea. Barney, what do you think?"

"Could be—but it would take a redesign."

"Fine. And may we pray that the redesign is good enough to make a difference to the Interplanetary Patent Office." Channing called Joe. "The same. Three Moons all around. Scotch,"

he explained to the others, "synthesized in the Palanortis Country."

"Our favorite import," said Walt.

Joe grinned. "Another tablecloth session in progress?"

"Could be. As soon as we oil the think-tank, we'll know for sure."

"What does he mean?" asked Barney.

Joe smiled. "They all have laboratories and draftsmen and textbooks," he said. "But for real engineering, they use my tablecloths. Three more problems and I'll have a complete tablecloth course in astrophysics, with a sideling in cartooning, and a minor degree in mechanical engineering."

"Oh?"

"Sure. Give 'em free hand, and a couple of your tubes and a tablecloth and they'll have 'em frying eggs by morning. When I came out here, they demanded a commercial bond and I thought they were nuts. Who ever heard of making a restaurateur post a bond? I discovered that all of their inventions are initially tinkered out right here in the dining room—I could steal 'em blind if I were dishonest!" Joe smiled hugely. "This is the only place in the system where the tablecloths have been through blueprint machines. That," he said confidentially to Barney, "is why some of the stuff is slightly garbled. Scotch mixed with the drawings. They have the cloths inspected by the engineering department before they're laundered; I lose a lot of tablecloths that way."

Joe left cheerfully amid laughter.

The Three Moons came next, and then Don began to sketch. "Suppose we make a driver tube like this," he said. "And we couple the top end, where the cathode is to the input side of the relay tube. Only the input side will require a variable-impedance anode, coupled back from the cathode to limit the input to the required value. Then the coupling anodes must be served with an automatic-coupling circuit so that the limiting power is passed without wastage."

Barney pulled out a pencil. "If you make that automatic-coupling circuit dependent upon the output from the terminal ends," he said, "it will accept only the amount of input that is required by the power being used from the output. Overcooling these two anodes will inhibit the power-intake."

"Right," said Wes. "And I am of the opinion that the power available from Sol is of a magnitude that will permit operation over and above the limit."

"Four million tons of energy per second!" exploded Walt. "That's playing with fire!"

"You bet. We'll fix 'em with that!"

"Our experience with relay tubes," said Farrell slowly, "indicates that some increase in range is possible with additional anode-focusing. Build your tube-top with an extra set of anodes, and that'll give us better control of the beam."

"We're getting farther and farther from the subject of communi-

cation," said Channing with a smile. "But I think that we'll get more out of this."

"How so?"

"Until we get a chance to tinker with those tubes, we won't get ship-to-ship two ways. So we'll gadgeteer up something that will make Terran Electric foam at the mouth, and swap a hunk of it for full freedom in our investigations. Or should we bust Terran Electric wholeheartedly?"

"Let's slug 'em," said Walt.

"Go ahead," said Wes. "I'm utterly disgusted, though I think our trouble is due to the management of Terran Electric. They like legal tangles too much."

"We'll give 'em a legal tangle," said Barney. He was adding circuits to the tablecloth sketch.

Channing, on his side, was sketching in some equations, and Walt was working out some mechanical details. Joe came over, looked at the tablecloth, and forthright went to the telephone and called Walton. The mechanical designer came, and Channing looked up in surprise. "Hi," he said. "I was about to call you."

"Joe did."

"O. K. Look, Ted, can you fake us up a gadget like this?"

Walton looked the thing over. "Give me about ten hours," he said.

"We've got a spare turnover driver from the *Relay Girl* that we can hand-carve. There are a couple of water-boilers that we can strip, cut open, and make to serve as the top end. How're you hoping to maintain the vacuum?"

"Yes," said Wes Farrell, "That's going to be the problem. If there's any adjusting of electrodes to do, this'll take months."

"That's why we, on Venus Equilateral, are ahead of the whole ding-busted solar system in tube development," said Don. "We'll run the thing out in the open—and I *do* mean open! Instead of the tube having the insides exhausted, the operators will have their envelopes served with fresh, canned air."

"Like a cartoon I saw somewhere," grinned Walt. "Had a bird in full armor tinkering with a radio set. The caption was: 'Why shield the set!'"

"Phooey," said Ted Walton, "Look, Tom Swift, is this another one of the Franks' brainchildren?"

"Tom Swift?" asked Wes.

"Yeah. That's the nom de plume he invents under. The other guy we call Captain Lightning."

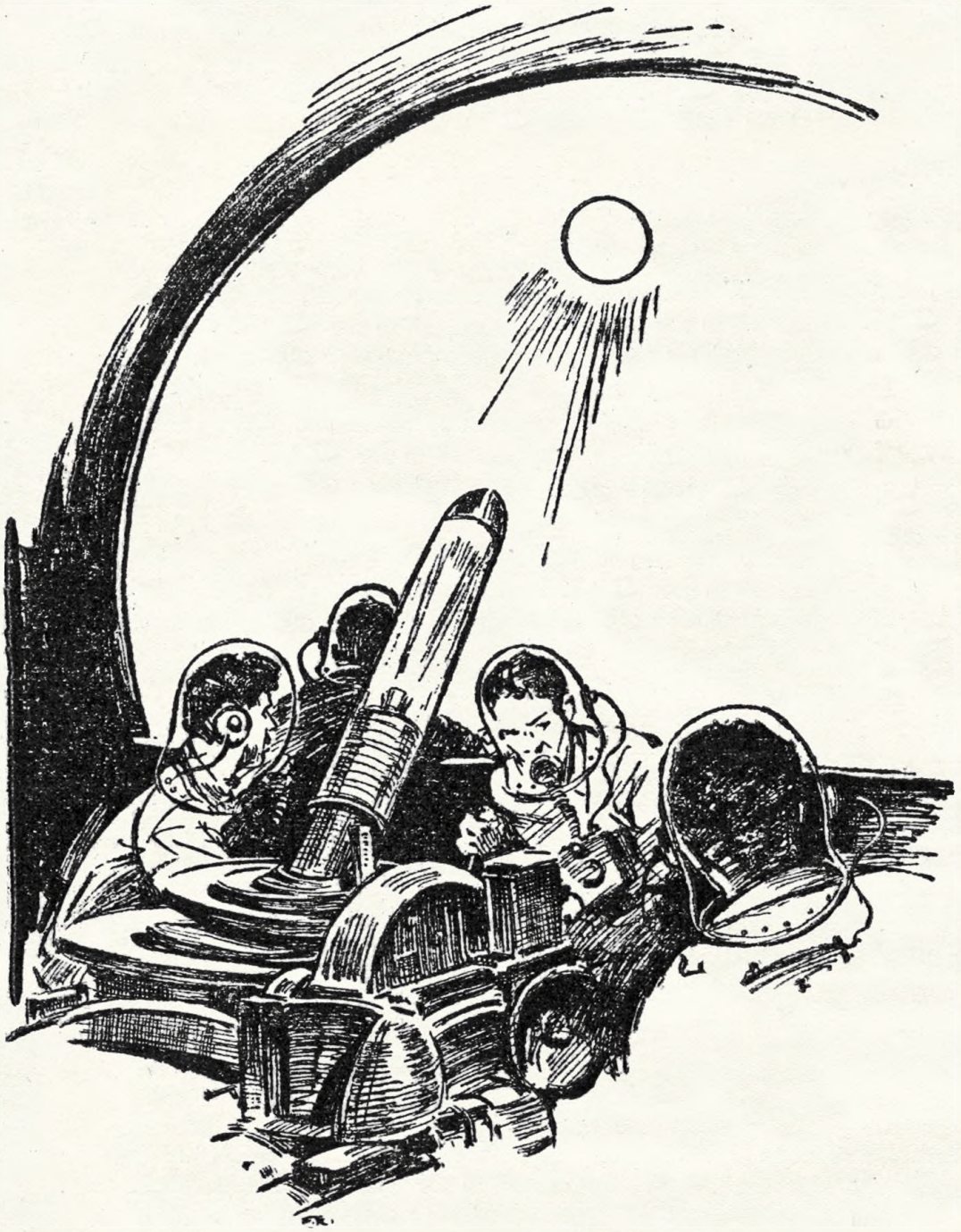
"Oh?" asked Farrell, "Do you read him, too?"

"Sure," grinned Walton. "And say, speaking of comics, I came upon an old, old volume of Webster's International Dictionary in a rare-edition library a couple of months ago in Chicago, and they define 'Comic' as amusing, funny, and ludicrous; not imaginative fiction. How things change."

"They do."

"But to get back to this goldberg, what is it?"

"Ted," said Channing soberly, "sit down!" Walton did. "Now," grinned Channing, "this screwball gadget is an idea whereby we hope



to draw power out of the sun."

Walton swallowed once, and then waved for Joe. "Double," he told the restaurateur. Then to the others he said, "Thanks for seating me. I'm ill, I think. Hearing things. I could swear I heard someone say that this thing is to take power from Sol."

"That's it."

"Um-m-m. Remind me to quit Saturday. This is no job for a man beset by hallucinations."

"You grinning idiot, we're not fooling."

"Then you'd better quit," Walton told Don. "This is no job for a bird with delusions of grandeur,

either. Look, Don, you'll want this in the experimental blister at South end? On a coupler to the beam-turret so that it'll maintain direction at Sol?"

"Right. Couple it to the rotating stage if you can. Remember, that's three miles from the South end."

"We've still got a few high-power selsyns," said Walton, making some notations of his own on the tablecloth. "And thanks to the guys who laid out this Station some years ago, we've plenty of unused circuits from one end to the other. We'll couple it, all right. Oh mother. Seems to me like you got a long way off of your intended subject. Didn't you start out to make a detector for driver radiation?"

"Yup."

"And you end up tapping the sun. D'ye think it'll ever replace slave labor?"

"Could be. Might even replace the coal mine. That's to be seen. Have any idea of how long you'll be?"

"Make it ten hours. I'll get the whole crew on it at once."

"Fine."

"But look. What's the reason for this change in program?"

"That's easy," said Don. "First, we had a jam session. Second, we've come to the conclusion that the longest way around is often the shortest way home. We're now in the throes of building something with which to dazzle the bright-minded management of Terran Electric and thus make them susceptible to our charm. We want a free hand at the transmission tubes, and this looks like a fair bit of bait."

"I get it. Quote: 'Why buy power from Terran Electric? Hang a Channing Power Beam on your chimney pot and tap the sun!' Woah, Maizie. Bring on the needle, Watson. Hang out the flags, fire the cannon, ring the bells; for Venus Equilateral is about to hang a pipeline right into four million tons of energy per second! Don, that's a right, smart bit of power to doodle with. Can you handle it?"

"Sure," said Channing with a wave of his hand, "we'll hang a fuse in the line!"

"O. K.," said Walton, sweeping the tablecloth off the table like Mysto, the Magician; right out from under the glasses, "I'll be back—wearing my asbestos pants!"

Wes Farrell looked dreamily at the ceiling. "This *is* a screwy joint," he said idly. "What do we do for the next ten hours?"

"Red Herring stuff," said Channing with what he hoped was a Machiavellian leer.

"Such as?"

"Making wise moves with the transmission tubes. Glomming the barrister's desk with proposed ideas for his approval; as many as we can think of so that he'll be kept busy. We might even think of something that may work, meanwhile. Come, fellow conspirators, to horse!" Channing picked up his glass and drained it, making a wry face. "Rotten stuff—I wish I had a barrel of it!"

Channing surveyed the set-up in the blister. He inspected it carefully, as did the others. When he spoke, his voice came through the helmet receivers with a slightly tinny sound: "Anything wrong? Looks O. K. to me."

"O. K. by me, too," said Farrell.

"Working in suit is not the best," said Don. "Barney, you're the bright-eyed lad, can you align the plates?"

"I think so," came the muffled booming of Barney's powerful voice. "Gimme screwdriver!"

Barney fiddled with the plate-controls for several minutes. "She's running on dead center alignment, now," he announced.

"Question," put in Wes, "do we get power immediately, or must we wait whilst the beam gets there and returns?"

"You must run your power line before you get power," said Walt. "My money is on the wait."

"Don't crack your anode-coupling circuit until then," warned Wes. "We don't know a thing about this; I'd prefer to let it in easy-like instead of opening the gate and letting the whole four million tons per second come roaring in through this ammeter."

"Might be a little warm having Sol in here with us," laughed Channing. "This is once in my life when we don't need a milliammeter, but a million-ammeter!"

"Shall we assign a pseudonym for it?" chuckled Walt.

"Let's wait until we see how it works."

The minutes passed slowly, and then Wes announced: "She should be here. Crack your anode-coupler, Barney."

Barney advanced the dial, gingerly. The air that could have grown tense was, of course, not present in the blister. But the term is but a figure of speech, and therefore it may be proper to say that the air grew tense. Fact is, it was the nerves of the men that grew tense. Higher and higher went the dial, and still the meter stayed inert against the zero-end pin.

"Not a wiggle," said Barney in disgust. He twirled the dial all the way around, and snorted. The meter left the zero pin ever so slightly.

Channing turned the switch that increased the sensitivity of the meter until the needle stood halfway up the scale.

"Solar power, here we come," he said in a dry voice. "One half ampere at seven volts! Three and one half watts. Bring on your atom-smashers! Bring on your power-consuming factory-districts. Hang the whole load of Central United States on the wires, for we have three and one half watts! Just enough to run an electric clock!"

"But would it keep time?" asked Barney. "Is the frequency right?"

"Nope—but we'd run it. Look, fellows, when anyone tells you about this, insist that we got thirty-five hundred milliwatts on our first try. It sounds bigger."

"O.K., so we're getting from Sol just about three tenths of the soup we need to make the set-up self-sustaining," said Walt. "Wes,

this in-phase anode of yours—what can we do with it?"

"If this thing worked, I was going to suggest that there is enough power out there to spare. We could possibly modulate the in-phase anode with anything we wanted, and there would be enough junk floating around in the photosphere to slam on through."

"Maybe it is that lack of selectivity that licks us now," said Don. "Run the voltage up and down a bit. There should be D.C. running around in Sol, too."

"Whatever this power-level is running at," said Barney, "we may get in-phase voltage—or in-phase power by runing a line from the power terminal back. Move over, boys, I'm going to hang a test clip in here."

Barney's gloved hands fumbled a bit, but the clip was attached. He opened the anode-coupler once again, and the meter slammed against the full-scale peg.

"See?" he said triumphantly.

"Yup," said Channing cryptically. "You, Bernard, have doubled our input."

"Mind if I take a whack at aligning it?" asked Wes.

"Go ahead. What we need is a guy with eyes in his fingertips. Have you?"

"No, but I'd like to try."

Farrell worked with the deflection plate alignment, and then said, ruefully: "No dice. Barney had it right on the beam."

"Is she aligned with Sol?" asked Channing.

Walt squinted down the tube. "Couldn't be better," he said, blinking.

"Could it be that we're actually missing Sol?" asked Don. "I mean, could it be that line-of-sight and line-of-power aren't one and the same thing?"

"Could be," asknowledged Wes. Walt stepped to the verniers and swung the big intake tube over a minute arc. The meter jumped once more, and Channing stepped the sensitivity down again. Walt fiddled until the meter read maximum and then he left the tube that way.

"Coming up," said Channing. "We're now four t i m e s our original try. We now have enough juice to run an electric train—a toy train! Someone think of something else, please. I've had my idea for the day."

"Let's juggle electrode-spacing," suggested Wes.

"Can do," said Walt, brandishing a huge spanner wrench in one gloved hand.

Four solid, futile hours later, the power output of the solar beam was still standing at a terrifying fourteen watts. Channing was scratching furiously on a pad of paper with a large pencil; Walt was trying voltage-variations on the supply-anodes in a desultory manner; Barney was measuring the electrode spacing with a huge vernier rule, and Wes was staring at the sun, dimmed to seeable brightness by a set of dark glasses.

Wes was muttering to himself. "Electrode-voltages, O.K. . . . alignment perfect . . . solar power output

. . . not like power-line electricity . . . solar composition . . . Russell's Mixture—"

"Whoooo said that!" roared Channing.

"Who said what?" asked Barney.

"Why bust our eardrums?" objected Walt.

"What do you mean?" asked Wes, coming to life for the moment.

"Something about Russell's Mixture. Who said that?"

"I did. Why?"

"Look, Wes, what are your cathodes made of?"

"Thorium, C. P. metal. That's why they are shipped in metal containers in a vacuum."

"What happens if you try to use something else?"

"Don't work very well. In fact, if the output cathode and the input dynode are not the same metal, they won't pass power at all."

"You're on the trail right now!" shouted Channing. "Russell's Mixture?"

"Sounds like a brand of smoking tobacco to me. Mind making a noise like an encyclopedia and telling me what is Russell's Mixture?"

"Russell's Mixture is a conglomeration of elements which go into the making of Sol—and all the other stars," explained Don. "Hydrogen, Oxygen, Sodium, and Magnesium, Iron, Silicon, Potassium, and Calcium. They, when mixed according to the formula for Russell's Mixture, which can be found in any book on the composition of stars, become the most probable mixture of metals. They—Russell's Mixture—go into the composition of all stars, what isn't mentioned in the mix isn't important."

"And what has this Russell got that we haven't got?" asked Walt.

"H, O, Na, Mg, Fe, Si, K, and Ca. And we, dear people, have Th, which Russell has not. Walt, call the metallurgical lab and have 'em whip up a batch."

"Cook to a fine edge and serve with a spray of parsley? Or do we cut it into cubes—"

"Go ahead," said Channing. "Be funny. You just heard the man say that dissimilar dynode-cathodes do not work. What we need for our solar beam is a dynode of Russell's Mixture so that it will be similar to our cathode—which in this case is Sol. Follow me?"

"Yeah," said Walt. "I follow, but brother I'm a long way behind. But I'll catch up," he promised as he made connection between his suit-radio and the Station communicator system. "Riley," he said, "Here we go again. Can you whip us up a batch of Russell's Mixture?"

Riley's laugh was audible to the others, since it was broadcast by Walt's set. "Yeah, man, we can —if it's got metal in it? What, pray tell, is Russell's Mixture?"

Walt explained the relation between Russell's Mixture and the composition of Sol.

"Sun makers, hey?" asked Riley. "Is the chief screwball there?"

"Yup," said Walt, grinning at Don.

"Sounds like him. Yeah, we can

make you an alloy consisting of Russell's Mixture. Tony's got it here, now, and it doesn't look hard. How big a dynode do you want?"

Walt gave him the dimensions of the dynode in the solar tube.

"Cinch," said Riley. "You can have it in two hours."

"Swell."

"But it'll be hotter than hell. Better make that six or seven hours. We may run into trouble making it jell."

"I'll have Adren slip you some pectin," said Walt. "Tomorrow morning then?"

"Better. That's a promise."

Walt turned to the rest. "If any of us can sleep," he said, "I'd suggest it. Something tells me that tomorrow is going to be one of those days that mother told me about. I'll buy a drink."

Walt opened the anode-coupler circuit, and the needle of the output ammeter slammed across the scale and wound the needle halfway around the stop pin. The shunt, which was an external, high-dissipation job, turned red, burned the paint off of its radiator fins, and then proceeded to melt. It sputtered in flying droplets of molten metal. Smoke spewed from the case of the ammeter, dissipating in the vacuum of the blister.

Walt closed the coupler circuit.

"Whammo!" he said. "Mind blowing a hundred-amp meter?"

"No," grinned Don. "I have a thousand amp job that I'll sacrifice in the same happy-hearted fashion. Get an idea of the power?"

"Voltmeter was hanging up around ten thousand volts just before the amp-meter went by-by."

"Um-m-m. Ten thousand volts at a hundred amps. That is one million watts, my friends, and no small potatoes. To run the Station's communicating equipment we need seven times that much. Can we do it?"

"We can. I'll have Jim Warren start running the main power bus down here and we'll try it. Meanwhile, we've got a healthy cable from the generator room; we can run the noncommunicating drain of the Station from our plaything here. That should give us an idea. We can use a couple of million watts right there. If this gadget will handle it, we can make one that will take the whole load without groaning. I'm calling Jim right now. He can start taking the load over from the generators as we increase our intake. We'll fade, but not without a flicker."

Walt hooked the output terminals of the tube to the huge cable blocks, using sections of the same heavy cable.

Jim Warren called: "Are you ready?"

"Fade her in," said Walt. He kept one eye on the line voltmeter and opened the anode-coupler slightly. The meter dipped as Warren shunted the Station load over to the tube circuit. Walt brought the line voltage up to above normal, and it immediately dropped as Warren took more load from the solar intake. This jockeying went on for several minutes until War-

ren called: "You've got it all. Now what?"

"Start running the bus down here to take the communications load," said Don. "We're running off of an eight hundred thousand mile cathode now, and his power output is terrific. Or better, Jim, run us a high-tension line down here and we'll save silver. We can ram ten thousand volts up there for transformation. Get me?"

"What frequency?"

"Yeah," drawled Channing, "have Charley Thomas run us a control line from the primary frequency standard. We'll control our frequency with that. O.K.?"

"Right-o."

Channing looked at the set-up once more. It was singularly unprepossessing, this conglomeration of iron and steel and plastic. There was absolutely nothing to indicate the two and one third million watts of power that coursed from Sol, through its maze of anodes, and into the electric lines of Venus Equilateral. The cathodes and dynode glowed with their usual dull red glow, but there was no coruscating aura of power around the elements of the system. The gymbals that held the big tube slid easily, permitting the tube to rotate freely as the selsyn motor kept the tube pointing at Sol. The supply cables remained cool and operative, and to all appearances, the set-up was inert.

"O.K., fellows," said Channing. "This is it—"

He was interrupted by the frantic waving of Kingman, from the other side of the air lock.

"I feel slightly conscience-stricken," he said with a smile that showed that he didn't mean it at all. "But let us go and prepare the goat for shearing."

Kingman's trouble was terrific, according to him. "Mr. Channing," he complained, "you are not following our wishes. And you, Mr. Farrell, have been decidedly amiss in your hobnobbing with the engineers here. You were sent out as my consultant, not to assist them in their endeavors."

"What's your grief?" asked Channing.

"I find that your laboratory has been changing the circuits without having previously informed me of the proposed change," complained Kingman. "I feel that I am within my rights in removing the tubes brought here. Your investigations have not been sanctioned—" he looked out through the air lock. "What are you doing out there?"

"We have just succeeded in taking power from the sun," said Don. He tried to keep his voice even, but the exultation was too high in him, and his voice sounded like sheer joy.

"You have been—" Kingman did a double-take. "You *what?*" he yelled.

Have succeeded in tapping Sol for power."

"Why, that's wonderful."

"Thank you," said Don. "You will no doubt be glad to hear that Wes Farrell was instrumental in this program."

"Then a certain part of the idea is rightfully the property of Terran Electric," said Kingman.

"I am afraid not," said Don. "Dr. Farrell's assistance was not requested. Though his contribution was of great value, it was given freely. He was not solicited. Therefore, since Terran Electric was not consulted formally, Dr. Farrell's contribution to our solar power beam can not be considered as offering a hold on our discovery."

"This is true, Dr. Farrell?"

"I'm afraid so. You see, I saw what was going on and became interested, academically. I naturally offered a few minor suggestions, in somewhat the same manner as a motorist will stop and offer another motorist assistance in changing a tire. The problem was interesting to me and as a problem, it did not seem to me—"

"Your actions in discussing this with members of the Venus Equilateral technical staff without authorization will have cost us plenty," snapped Kingman. "However, we shall deal with you later."

"You know," said Farrell with a cheerfully malicious grin, "if you had been less stuffy about our tubes, they might be less stuffy about my contribution."

"Ah, these nonlegal agreements are never satisfactory. But that is to be discussed later. What do you intend to do with your invention, Dr. Channing?"

Channing smiled in a superior manner. "As you see, the device is small. Yet it handles a couple

of million watts. An even smaller unit might be made that would suffice to supply a home, or even a community. As for the other end, I see no reason why the size might not be increased to a point where it may obsolete all existing power-generating stations."

Kingman's complexion turned slightly green. He swallowed hard. "You, of course, would not attempt to put this on the market yourself."

"No?" asked Channing. "I think you'll find that Interplanetary Communications is as large, if not larger, than Terran Electric, and we have an enviable reputation for delivering the goods. We could sell refrigerators to the Titan Colony if we had the V-E label on them and claimed they were indispensable. Our escutcheon is not without its adherents."

"I see," said Kingman. His present volubility would not have talked a jury into freeing the armless wonder from a pickpocketing charge. "Is your invention patentable?"

"I think so. While certain phases of it are like the driver tube, which, of course, is public domain, the applications are quite patentable. I must admit that certain parts are of the power transmission tube, but not enough for you to claim a hold, I know. At any rate, I shall be busy for the next hour, transmitting the details to Washington, so that the Interplanetary Patent Office may rule on it. Our Terran legal department has a direct line there, you know, and they have been directed to maintain that contact at all cost."

"May I use your lines?"

"Certainly. They are public carriers. You will not be restricted any more than any other man. I am certain that our right to transmit company business without waiting for the usual turn will not be contested."

"That sounds like a veiled threat."

"That, sounds like slander!"

"Oh no. Believe me. But wait, Dr. Channing. Is there no way in which we may meet on a common ground?"

"I think so. We want free hand in this tube proposition."

"For which rights you will turn over a nominal interest in solar power?"

"Forty percent."

"But we—"

"I know, you want control."

"We'd like it."

"Sorry. Those are our terms. Take 'em or leave 'em."

"Supposing that we offer you full and unrestricted rights to any or all developments you or we make on the Martian transmission tubes?"

"That might be better to our liking."

"We might buck you," said Kingman, but there was doubt in his voice.

"Yes? You know, Kingman, I'm not too sure that Venus Equilateral wants to play around with power except as a maintenance angle. What if we toss the solar beam to the public domain? That is within our right, too."

Kingman's green color returned, this time accompanied with beads of sweat. He turned to Farrell. "Is there nothing we can do? Is this patentable?"

"No—Yes," grinned Farrell.

Kingman excused himself. He went to the office provided for him and began to send messages to the Terran Electric offices at Chicago. The forty minute wait between message and answer was torture to him, but it was explained to him that light and radio crossed space at one hundred and eighty-six thousand miles per second and that even an Act of Congress could do nothing to hurry it. Meanwhile, Channing's description tied up the Terran Beam for almost an hour at the standard rate of twelve hundred words per minute. Their answers came within a few minutes of one another.

Channing tossed the 'gram before Kingman. "Idea definitely patentable," said the wire.

Kingman stood up. Apparently the lawyer believed that his pronouncement would carry more weight by looming over the smiling, easy-going faces of his parties-of-the-second-part. "I am prepared to negotiate with your legal department; offering them, and you, the full rights to the use of the transmission tube. This will include full access to any and all discoveries, improvements, and/or changes made at any time from its discovery to the termination of this contract, which shall be terminated only by absolute mutual agreement between Terran Electric and Interplanetary Communications.

"In return for this, Interplanetary Communications will permit Terran Electric to exploit the solar beam tube fully and freely, and exclusively—"

"Make that slightly different," said Channing. "Terran Electric's rights shall prevail exclusively—*except* within the realm of space, upon man-made celestial objects, and upon the satellites and minor natural celestial bodies where stations of the Interplanetary Communications Company are established."

Kingman thought that one over. "In other words, if the transport companies desire to use the solar beam, you will hold domain from the time they leave an atmosphere until they again touch—"

"Let's not complicate things," smiled Don cheerfully. "I like uncomplicated things."

Kingman smiled wryly. "I'm sure," he agreed with fine sarcasm. "But I see your point. You intend to power the communications system with the solar beam. That is natural. Also, you feel that a certain amount of revenue should be coming your way. Yes, I believe that our legal departments can agree."

"So let's not make the transport companies change masters in midspace," smiled Don.

"You are taking a lot on your shoulders," said Kingman. "We wouldn't permit our technicians to dictate the terms of an agreement."

"You are not going to like Venus Equilateral at all," laughed Don. "We wouldn't permit our legal department to dabble in things of which they know nothing. Years ago, when the first concentric beam was invented, which we now use to punch a hole in the Heaviside

Layer, Communications was built about a group of engineers. We held the three inner planets together by the seat of our pants, so to speak, and nurtured communications from a slipshod, hope-to-God-it-gets through proposition to a sure thing. Funny, but when people were taking their messages catch as catch can, there was no reason for legal lights. Now that we can and do insure messages against their loss, we find that we are often tangled up with legal red tape.

"Otherwise, we wouldn't have a lawyer on the premises. They serve their purpose, no doubt, but in this gang, the engineers tell the attorneys how to run things. We shall continue to do so. Therefore you are speaking with the proper parties, and once the contract is prepared by you, we shall have an attorney run through the whereases, wherefores, and parties of the first, second, and third parts to see that there is no sleight of hand in the microscopic type."

"You're taking a chance," warned Kingman. "All men are not as fundamentally honest as Terran Electric."

"Kingman," smiled Channing, "I hate to remind you of this, but who got what just now? We wanted the transmission tube."

"I see your point. But we have a means of getting power out of the sun."

"We have a hunk of that too. It would probably have been a mere matter of time before some bright bird at Terran found the thing as it was."

"I shall see that the contract gives you domain over man-made objects in space—including those that occasionally touch upon the natural celestial objects. Also the necessary equipment operating under the charter of Interplanetary Communications, wherever or whenever it may be, including any future installations."

"Fine."

"You may have trouble understanding our feelings. We are essentially a space-born company, and as such we can have no one at the helm that is not equipped to handle the technical details of operation in space." Channing smiled reminiscently. "We had a so-called efficiency expert running Venus Equilateral a couple of years ago, and the fool nearly wrecked us because he didn't know that the airplant was not a mass of highly complicated, chemical reaction machinery instead of what it really is. Kingman, do you know what an airplant is?"

"Frankly no. I should imagine it is some sort of air-purifying device."

"You'll sit down hard when I tell you that the airplant is just what it is. Martian Sawgrass! What better device in the solar system can be used for air-purifying than a chlorophyll-bearing plant; it takes in carbon dioxide and gives off oxygen. Brother Burbank tossed it in the incinerator because he thought it was just weeds, cluttering up the place. He was allergic

to good engineering, anyway."

"That may be good enough in space," said Kingman, "but on Terra, we feel that our engineers are not equipped to dabble in the legal tangles that follow when they force us to establish precedent by inventing something that has never been covered by a previous decision."

"O.K.," said Don. "Every man to his own scope. Write up your contract, Kingman, and we'll all climb on the bandwagon with our illiterary X's."

In Evanston, North of Chicago, the leaves changed from their riotous green to a somber brown, and fell to lay a blanket over the earth. Snow covered the dead leaves, and Christmas, with its holly went into the past, followed closely by New Year's Eve with its hangover.

And on a roof by the shore of Lake Michigan, a group of men stood in overcoats beside a huge machine that towered above the great letters of the Terran Electric Company sign that could be seen all the way from Gary, Indiana.

It was a beautiful thing, this tube; a far cry from the haywire thing that had brought solar power to Venus Equilateral. It was mounted on gymbals, and the metal was bright-plated and perfectly machined. Purring motors caused the tube to rotate to follow the sun.

"Is she aligned?" asked the project engineer.

"Right on the button."

"Good. We can't miss with this one. There may have been something sour with the rest, but this one ran Venus Equilateral — the whole Relay Station—for ten days without interruption."

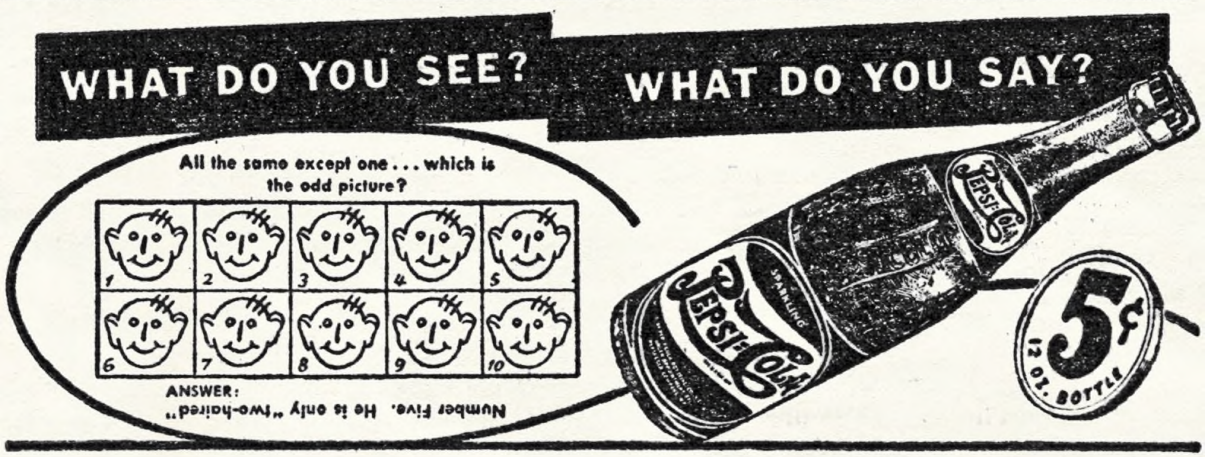
He faced the anxious men in overcoats. "Here we go," he said, and his hand closed upon the switch that transferred the big tube from test power to operating power.

The engineer closed the switch, and stepped over to the great, vaned, air-cooled ammeter shunt. On a panel just beyond the shunt the meter hung—

At Zero!

"Um," said the project engineer. "Something wrong, no doubt."

They checked every connection,



every possible item in the circuit.

"Nothing wrong."

"Oh now look," said the project engineer. "This isn't hell, where the equipment is always perfect except that it doesn't work."

"This is hell," announced his assistant. "The thing is perfect—except that it doesn't work."

"It worked on Venus Equilateral."

"We've changed nothing, and we handled that gadget like it was made of cello-gel. We're running the same kind of voltage, checked on Standard Voltmeters. We're within one tenth of one percent of the original operating conditions. But—no power."

"Call Channing."

The beams between Terra and Venus Equilateral carried furious messages for several hours. Channing's answer said: "I'm curious. Am bringing the experimental ship to Terra to investigate."

The project engineer asked: "Isn't that the job that they hooked up to use solar power for their drive?"

His assistant said: "That's it. And it worked."

"I know. I took a run on it!"

Channing was taking a chance, running the little *Anopheles* to Terra, but he knew his ship, and he was no man to be overcautious. He drove it for Terra at three G, and by dead reckoning, started down into Terra's blanket of air, heading for the Terran Electric plant which was situated on the lake shore.

Then down out of the cloudless sky came the *Anopheles* in a free fall. It screamed with the whistle of tortured air as it fell, and it caught the attention of every man that was working at Terran Electric.

Only those on the roof saw the egg-shaped hull fall out of the sky unchecked; landing fifteen hundred yards off shore in Lake Michigan.

The splash was terrific.

"Channing—!" said the project engineer, aghast.

"No, look there—a lifeship!"

Cautiously sliding down, a minute lifeship less than the size of a freight car came to a landing in the Terran Electric construction yard. Channing emerged, his face white. He bent down and kissed the steel grille of the construction yard fervently.

Someone ran out and gave Channing a brown bottle. Don nodded, and took a draw of monstrous proportions. He gagged, made a face, and smiled in a very wan manner.

"Thanks," he said shakily. He took another drink, of more gentlemanly size.

"What happened?"

"Dunno. Was coming in at three G. About four hundred miles up, the deceleration just quit. Like that! I made it to the skeeter, here, in just enough time to get her away about two miles ago. *Whoosh!*"

Don dug into his pocket and found cigarettes. He lit up and drew deeply. "Something cockeyed, here. That stoppage might make me think that my tube failed; but—"

"You suspect that our tube isn't working for the same reason?" finished the project engineer.

"Yes. I'm thinking of the trick, ultra-high powered, concentric beams we have to use to ram a hole through the Heaviside Layer. We start out with three million watts of sheer radio frequency and end up with just enough to make our receivers worth listening to. Suppose this had some sort of Heaviside Layer?"

"In which case, Terran Electric hasn't got solar power," said the project engineer. "Tim, load this bottle into the *Electric Lady,* and we'll see if we can find this barrier." To Channing, he said: "You look as though you could stand a rest. Check into a hotel in Chicago and we'll call you when we're ready to try it out."

Channing agreed. A shave, a bath, and a good night's sleep did wonders for his nerves, as did a large amount of Scotch. He was at Terran Electric in the morning, once more in command of himself.

Up into the sky went the ship that carried the solar tube. It remained inert until the ship passed above three hundred and forty miles. Then the ammeter needle swung over, and the huge shunt grew warm. The tenuous atmosphere outside of the ship was unchanged, yet the beam drew power of gigantic proportions.

They dropped again. The power ceased.

They spent hours rising and falling, charting this unknown barrier that stopped the unknown radiation from bringing solar power right down to earth. It was there, all right, and impervious. Above, megawatts raced through the giant shunt. Below, not even a microammeter could detect a trace of current.

"O.K., Don," said the project engineer. "We'll have to do some more work on it. It's nothing of your doing."

Mark Kingman's face was green again, but he nodded in agreement. "We seem to have a useless job here, but we'll think of something."

Channing left for Venus Equilateral in two more days. They studied the barrier and established its height as a constant three hundred and thirty-nine, point seven six miles above Terra's mythical sea level. It was almost a perfect sphere, that did not change with the night and day as did the Heaviside Layer. There was no way to find out how thick it was, but thickness was of no importance, since it effectively stopped the beam.

And as Don Channing stepped aboard the *Princess of the Sky* to get home again, the project engineer said: "If you don't mind, I think we'll call that one the Channing Layer!"

"Yeah," grinned Don, pleased at the thought, "and forever afterward it will stand as a cinder in the eye of Terran Electric."

"Oh," said the project engineer, "We'll beat the Channing Layer."

The project engineer was a bum prophet—

THE END.

Invariant

by JOHN PIERCE

He discovered the secret of immortality—and a way to escape forever the boredom that never-ending life would eventually, inevitably, mean. But he never knew that latter fact.

Illustrated by Williams

You know the general facts concerning Homer Green, so I don't need to describe him or his surroundings. I knew as much and more, yet it was an odd sensation, which you don't get through reading, actually to dress in that primitive fashion, to go among strange surroundings, and to see him.

The house is no more odd than the pictures. Hemmed in by other twentieth century buildings, it must be indistinguishable from the original structure and its surroundings. To enter it, to tread on rugs, to see chairs covered in cloth with a nap,

to see instruments for smoking, to see and hear a primitive radio, even though operating really from a variety of authentic transcriptions, and above all, to see an open fire; all this gave me a sense of unreality, prepared though I was. Green sat by the fire in a chair, as we almost invariably find him, with a dog at his feet. He is perhaps the most valuable man in the world, I thought. But I could not shake off the sense of unreality concerning the substantial surroundings. He, too, seemed unreal, and I pitied him.

The sense of unreality continued through the form of self-introduction. How many have there been? I could, of course, examine the records.

"I'm Carew, from the Institute," I said. "We haven't met before, but they told me you'd be glad to see me."

Green rose and extended his hand. I took it obediently, making the unfamiliar gesture.

"Glad to see you," he said. "I've been dozing here. It's a little of a shock, the treatment, and I thought I'd rest a few days. I hope it's really permanent.

"Won't you sit down?" he added.

We seated ourselves before the fire. The dog, which had risen, lay down, pressed against his master's feet.

"I suppose you want to test my reactions?" Green asked.

"Later," I replied. "There's no hurry. And it's so very comfortable here."

Green was easily distracted. He relaxed, staring at the fire. This was an opportunity, and I spoke in a somewhat purposeful voice.

"It seems more a time for politics, here," I said. "What the Swede intends, and what the French—"

"Drench our thoughts in mirth —" Green replied.

I had thought from the records the quotation would have some effect.

"But one doesn't leave politics to drench his thoughts in mirth," he continued. "One studies them—"

I won't go into the conversation. You've seen it in Appendix A of my thesis, "An Aspect of Twentieth Century Politics and Speech." It was brief, as you know. I had been very lucky to get to see Green. I was more lucky to hit on the right thread directly. Somehow, it had never occurred to me before that twentieth century politicians had meant, or had thought that they meant, what they said; that indeed, they had in their own minds attached a sense of meaning or relevancy to what seem to us meaningless or irrelevant phrases. It's hard to explain so foreign an idea; perhaps an example would help.

For instance, would you believe that a man accused of making a certain statement would seriously reply, "I'm not in the habit of making such statements?" Would you believe that this might even mean that he had not made the statement? Or would you further believe that even if he had made the statement, this would seem to him to classify it as some sort of special

instance, and his reply as not truly evasive? I think these conjectures plausible, that is, when I struggle to immerse myself in the twentieth century. But I would never have dreamed them before talking with Green. How truly invaluable the man is!

I have said that the conversation recorded in Appendix A is very short. There was no need to continue along political lines after I had grasped the basic idea. Twentieth century records are much more complete than Green's memory, and that itself has been thoroughly catalogued. It is not the dry bones of information, but the personal contact, the infinite variation in combinations, the stimulation of the warm human touch, that are helpful and suggestive.

So I was with Green, and most of a morning was still before me. You know that he is given meal times free, and only one appointment between meals, so that there will be no overlapping. I was grateful to the man, and sympathetic, and I was somewhat upset in his presence. I wanted to talk to him of the thing nearest his heart. There was no reason I shouldn't. I've recorded the rest of the conversation, but not published it. It's not new. Perhaps it is trivial, but it means a great deal to me. Maybe it's only my very personal memory of it. But I thought you might like to know.

"What led to your discovery?" I asked him.

"Salamanders," he replied without hesitation. "Salamanders."

The account I got of his perfect regeneration experiments was, of course, the published story. How many thousands of times has it been told? Yet, I swear I detected variations from the records. How nearly infinite the possible combinations are! But the chief points came in the usual order. How the regeneration of limbs in salamanders led to the idea of perfect regeneration of human parts. How, say, a cut heals, leaving not a scar, but a perfect replica of the damaged tissue. How in normal metabolism tissue can be replaced not imperfectly, as in an aging organism, but perfectly, indefinitely. You've seen it in animals, in compulsory biology. The chick whose metabolism replaces its tissues, but always in an exact, invariant form, never changing. It's disturbing to think of it in a man. Green looked so young, as young as I. Since the twentieth century—

When Green had concluded his description, including that of his own innoculation in the evening, he ventured to prophesy.

"I feel confident," he said, "that it will work, indefinitely."

"It does work, Dr. Green," I assured him. "Indefinitely."

"We mustn't be premature," he said. "After all, a short time—"

"Do you recall the date, Dr. Green?" I asked.

"September 11th," he said. "1943, if you want that, too."

"Dr. Green, today is August 4, 2170," I told him earnestly.

"Look here," Green said. "If it

were, I wouldn't be here dressed this way, and you wouldn't be there dressed that way."

The impasse could have continued indefinitely. I took my communicator from my pocket and showed it to him. He watched with growing wonder and delight as I demonstrated, finally with projection, binaural and stereo. Not simple, but exactly the sort of electronic development which a man of Green's era associated with the future. Green seemed to have lost all thought of the conversation which had led to my production of the communicator.

"Dr. Green," I said, "the year is 2170. This is the twenty-second century."

He looked at me baffled, but this time not with disbelief. A strange sort of terror was spread over his features.

"An accident?" he asked. "My memory?"

"There has been no accident," I said. "Your memory is intact, as far as it goes. Listen to me. Concentrate."

Then I told him, simply and briefly, so that his thought processes would not lag. As I spoke to him he stared at me apprehensively, his mind apparently racing. This is what I said:

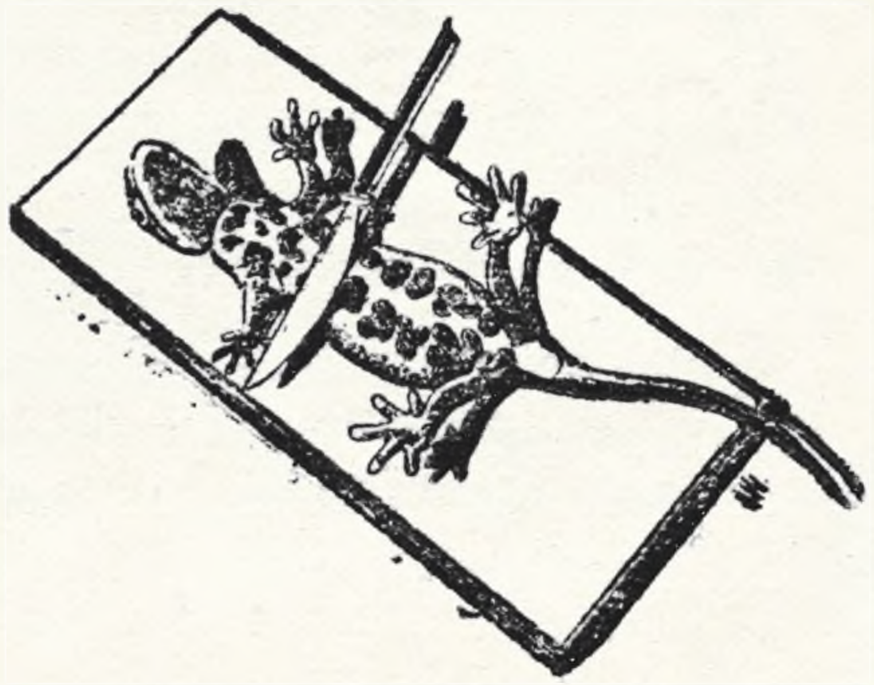
"Your experiment succeeded, beyond anything you had reason to hope. Your tissues took on the ability to reform themselves in exactly the same pattern year after year. Their form became invariant.

"Photographs and careful measurements show this, from year to year, yes, from century to century. You are just as you were over two hundred years ago.

"Your life has not been devoid of accident. Minor, even major wounds have left no trace in healing. Your tissues are invariant.

"Your brain is invariant, too; that is, as far as the cell patterns are concerned. A brain may be likened to an electrical network. Memory is the network, the coils and condensers, and their interconnections. Conscious thought is the pattern of voltages across them and currents flowing through them. The pattern is complicated, but transitory—transient. Memory is changing the network of the brain, affecting all subsequent thoughts, or patterns in the network. The network of your brain never changes. It is invariant.

"Or thought is like the complicated operation of the relays and switches of a telephone exchange of your century, but memory is the interconnections of elements. The interconnections on other people's brains change in the process of thought, breaking down, building up, giving them new memories. The pattern of connections in your



brain never changes. It is invariant.

"Other people can adapt themselves to new surroundings, learning where objects of necessity are, the pattern of rooms, adapting themselves unconsciously, without friction. You cannot; your brain is invariant. Your habits are keyed to a house, your house as it was the day before you treated yourself. It has been preserved, replaced through two hundred years so that you could live without friction. In it, you live, day after day, the day after the treatment which made your brain invariant.

"Do not think you give no return for this care. You are perhaps the most valuable man in the world. Morning, afternoon, evening; you have three appointments a day, when the lucky few who are judged to merit or need your help are allowed to seek it.

"I am a student of history. I came to see the twentieth century through the eyes of an intelligent man of that century. You are a very intelligent, a brilliant man. Your mind has been analyzed in a detail greater than that of any other. Few brains are better. I came to learn from this powerful observant brain what politics meant to a man of your period. I learned from a fresh new source, your brain, which is not overlaid, not changed by the intervening years, but is just as it was in 1943.

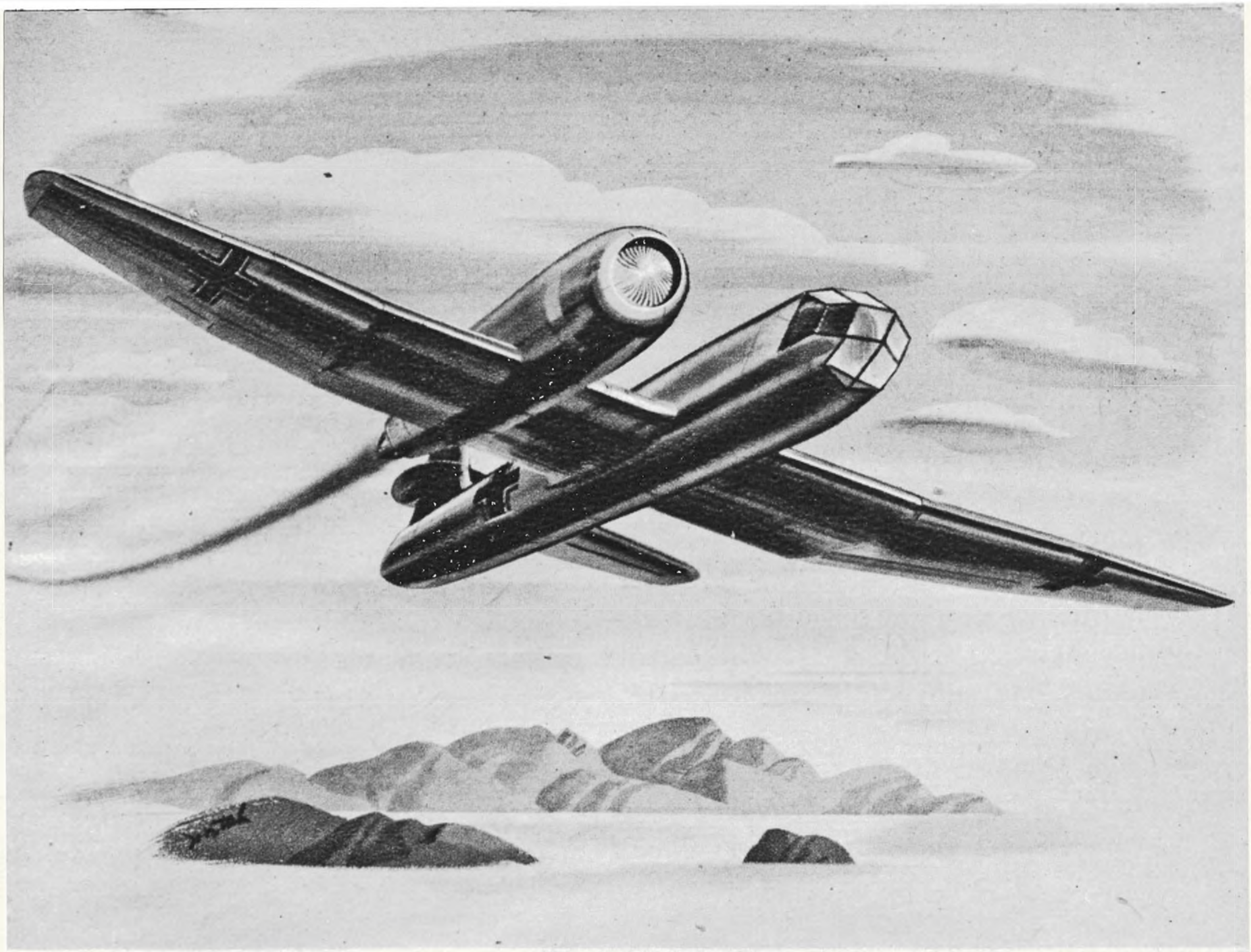
"But I am not very important. Important workers: psychologists, come to see you. They ask you questions, then repeat them a little differently, and observe your reactions. One experiment is not vitiated by your memory of an earlier experiment. When your train of thought is interrupted, it leaves no memory behind. Your brain remains invariant. And these men, who otherwise could draw only general conclusions from simple experiments on multitudes of different, differently constituted and differently prepared individuals, can observe undisputable differences of response due to the slightest changes in stimulus. Some of these men have driven you to a frenzy. You do not go mad. Your brain cannot change; it is invariant.

"You are so valuable it seems that the world could scarcely progress without your invariant brain. And yet, we have not asked another to do as you did. With animals, yes. Your dog is an example. What you did was willingly, and you did not know the consequences. You did the world this greatest service unknowingly. But we know."

Green's head had sunk to his chest. His face was troubled, and he seemed to seek solace in the warmth of the fire. The dog at his feet stirred, and he looked down, a sudden smile on his face. I knew this his train of thought had been interrupted. The transients had died from his brain. Our whole meeting was gone from his processes of thought.

I rose and stole away before he looked up. Perhaps I wasted the remaining hour of the morning.

THE END.



Not Quite Rockets

Since the Army announced the jet-propelled plane, many a science-fiction author, reader—and editor!—has discovered that friends, neighbors, and acquaintances are abruptly beginning to believe that rocket ships aren't exclusively the province of wild fantasy, screwball inventors, and impractical dreamers.

Some while back, it was mentioned editorially that the general public would never be shocked by the sudden announcement of a successful spaceship—it would be a simple "why, of course!" proposition of small steps upward. The high-altitude fighter, the higher-altitude reconnaissance plane, the super-altitude meteorological ship, the super-super-altitude scientific data collecting ship, each a little

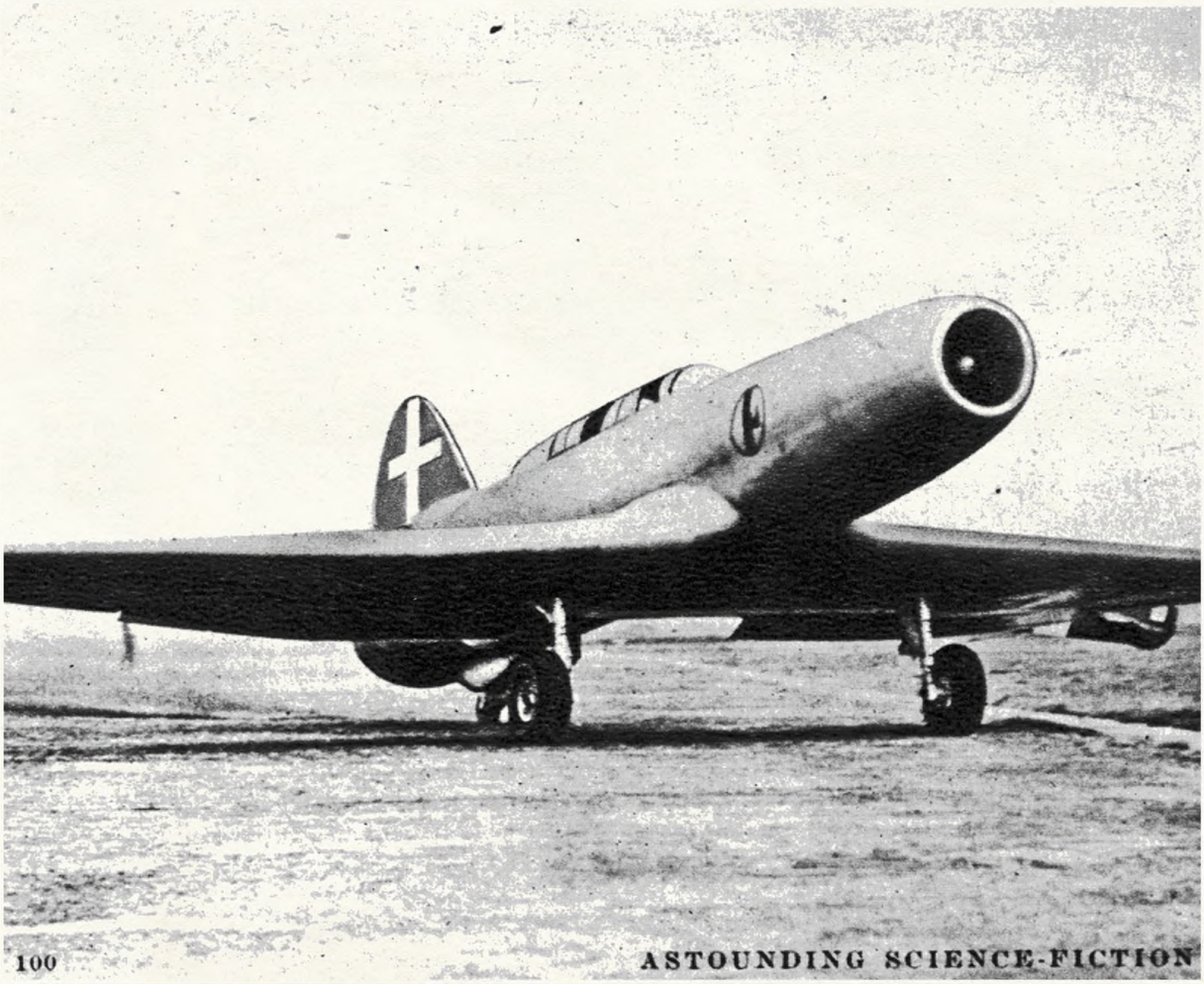
higher, each simply an improved model of something that has become an accepted "of course" thing.

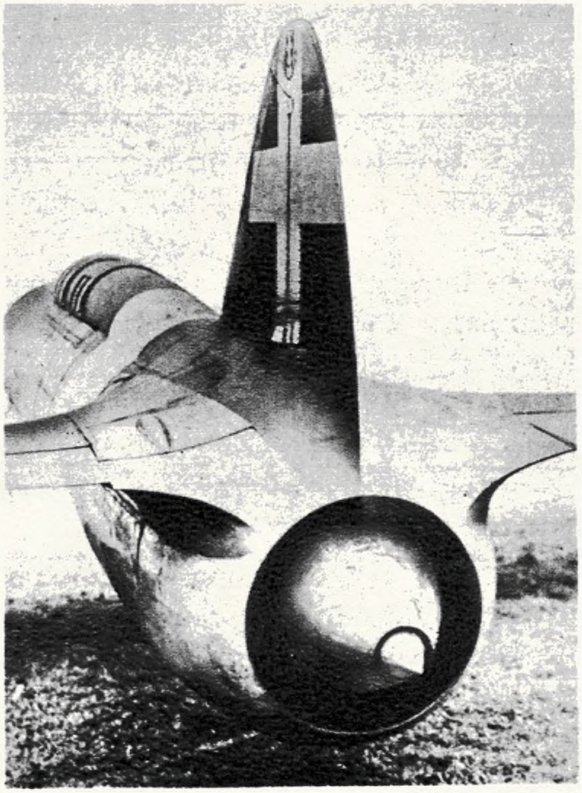
This new jet-propelled plane is perhaps the most violent surprise of that whole series, to the general public—a public now adjusted to bazooka guns, and rocket artillery. To rockets at work, in other words.

But it isn't new, of course. Newton didn't devise a jet-propelled plane, but did propose a jet-propelled automobile. The Italians, before we entered the war, had experimented with a jet-propelled plane, one sufficiently unsuccessful that they publicly boasted of their new jet-plane. (Military forces don't boast of successful devices until so many have been made, and so many people have already seen it, that the secrecy is gone anyway.)

More successful, and consequently less talked-about and less-photographed, was the Blohm & Voss asymmetrical jet-plane shown on page 99. The American plane is reported to be a twin-jet plane, somewhat similar to the Lockheed Lightning in outline. The jet-propelled plane necessarily has a rather violent slip-stream even without a propeller—it's a sound

The Italian-built Caproni-Campini jet-propelled plane, the first jet-plane to be acknowledged—probably because it was so complete a failure due to its short range as to permanently discourage the Italian researchers.
British Combine





British Combine

Tail structure of the Caproni-Campini, showing the exhaust jet orifice.

idea to keep it away from the plane's structure. A single-jet job requires that the jet either extend the full length of the fuselage—as in the Caproni-Campini of the Italians, shown on Page 100, or that the whole plane structure be asymmetrical. The Blohm & Voss plane followed the latter principle. The lopsided fuselage is obvious; the tail structure is also asymmetrical, serving to balance the off-side thrust of the engine, and, simultaneously, to get the last item of plane structure out of the jet's path.

Probably one reason for the lack of success of the Caproni-Campini plane was the excessive length of the jet-producing structure—the whole length of the plane—and the necessarily increased fuselage cross section. The Blohm & Voss asymmetrical plane is aerodynamically superior—but militarily a distinctly lame duck. Flying Fortresses, Mustangs, Lightnings and other American planes are noteworthy—in the German view, maddening—for their ability to come home when obviously unflyable. They come back with half a tail gone, one wing chopped off, the nose blown open, and large hunks carved out of the fuselage. A symmetrical plane has a margin of safety when rendered asymmetrical by damage that is not available to an inherently asymmetrical plane.

For some years my favorite reply to those Thomases who said rockets and "a lot of hot air" couldn't produce any *real* power or force has been that the most powerful machinery made by man was a harnassed multiple rocket, in principle—the steam turbine. The General Electric Co. has long been in that business; it is interesting and yet natural that the General Electric engineers, long experienced in jet design and jet-powered machinery, were called in to work out the design of the jet engine.

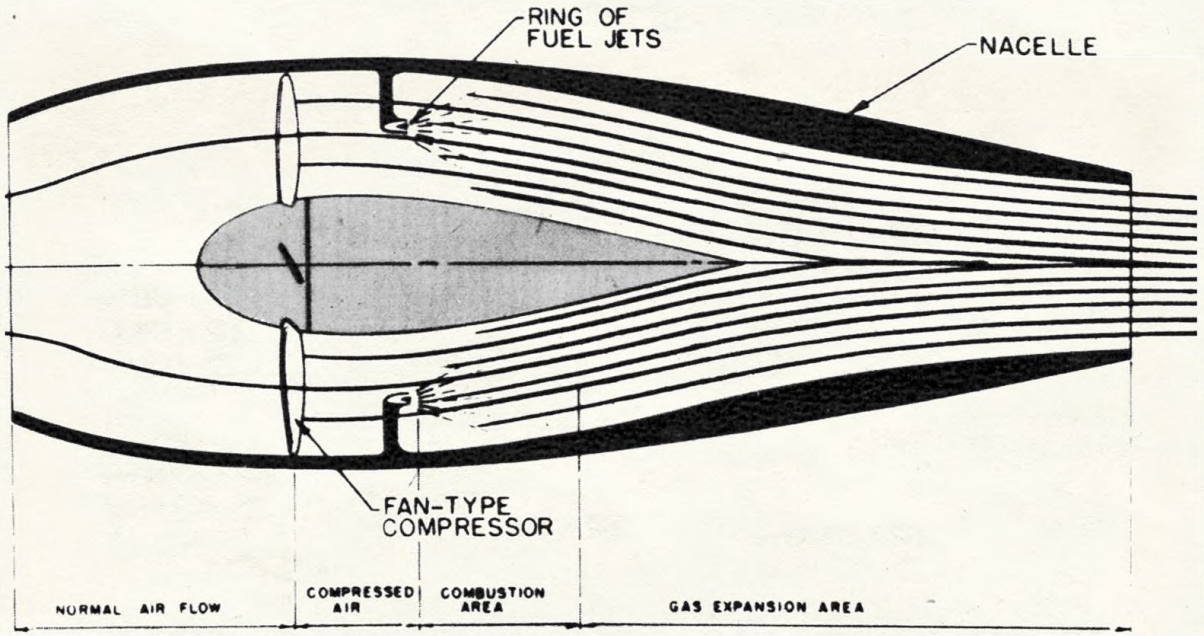
The jet engine is, of course, a modified rocket engine, and operates on the same essential principles. The main difference lies in the ratio between fuel mass, expelled mass, and fuel-energy-to-expelled-mass. The true rocket expels its fuel, so that fuel mass and expelled mass are equal—identical, in fact. To store a large amount of energy aboard the rocket at take-

off, a fuel of high energy content per pound is required, and high energy per pound means, when the chemical potential energy is converted by the rocket motor to kinetic energy, a very high jet velocity. The reaction produced by a jet is proportional to MV—the product of expelled mass times jet velocity. But the energy in the escaping jet gases is proportional to MV^2—the product of expelled mass times the square of the jet velocity. To double the reactive thrust, the mass must be doubled, or the velocity doubled—the latter requiring not twice, but four times as much fuel energy.

Ideally, the mass expelled should be enormous, the velocity as low as possible. For a rocket, where fuel-mass and expelled mass are identical, that's a lovely dream, but highly impractical. For the jet-propulsion plane, it's simple. The mass to be expelled is picked up at the front of the plane, the fuel simply furnishes energy, its mass being incidental—and accidental; in the jet plane they'd like a zero-mass fuel, a thing that would be useless for a rocket. The fuel-energy may be applied to the mass of air to be expelled in any way. Actually, a propeller-driven plane is a jet-propelled plane—the fuel-energy is applied to accelerate the air by way of a gasoline engine, gears, and a propeller. The jet-propelled plane, propellerless model, does things in a more direct manner, a simpler manner. The diagram at the top of Page 103 indicates the rudimentary system—a small propeller to pick up the mass to be expelled, and compress it somewhat. The compression is not a theoretical necessity, but is mechanically necessary to establish a sort of breechblock effect. The amount of compression established here determines the pressure attained in the combustion area, and hence the velocity of the final jet. Basically, *the reaction of the jet is against the compressor*, not against the other parts of the jet motor. (Theoretically, a cyclic process using a valve of some type as a breechblock, could replace the compressor. In such a cyclic jet-motor, the locus of the jet-reaction would be self-evident.)

Then isn't this simply an internal-propeller driven plane? No, because the compressor-blower handles a small volume of air in comparison to the total that is exhausted—the velocity of the gas leaving the compressor-blower is so low that it would not affect the plane appreciably, therefore, while the same mass leaves the jet at an immensely increased velocity. The pressure is the same, and is, actually, created by the expansion of the gas when heated by the burning fuel; the compressor-blower serves simply to keep that pressure from escaping forward.

Part—a large part—of the reason for the present success and previous failure of such jet motors lies in that compressor-blower. The blower is driven, apparently, by a gas-turbine in the jet-stream; the efficiency of the blower and of that driving turbine are extremely critical factors in the success or failure



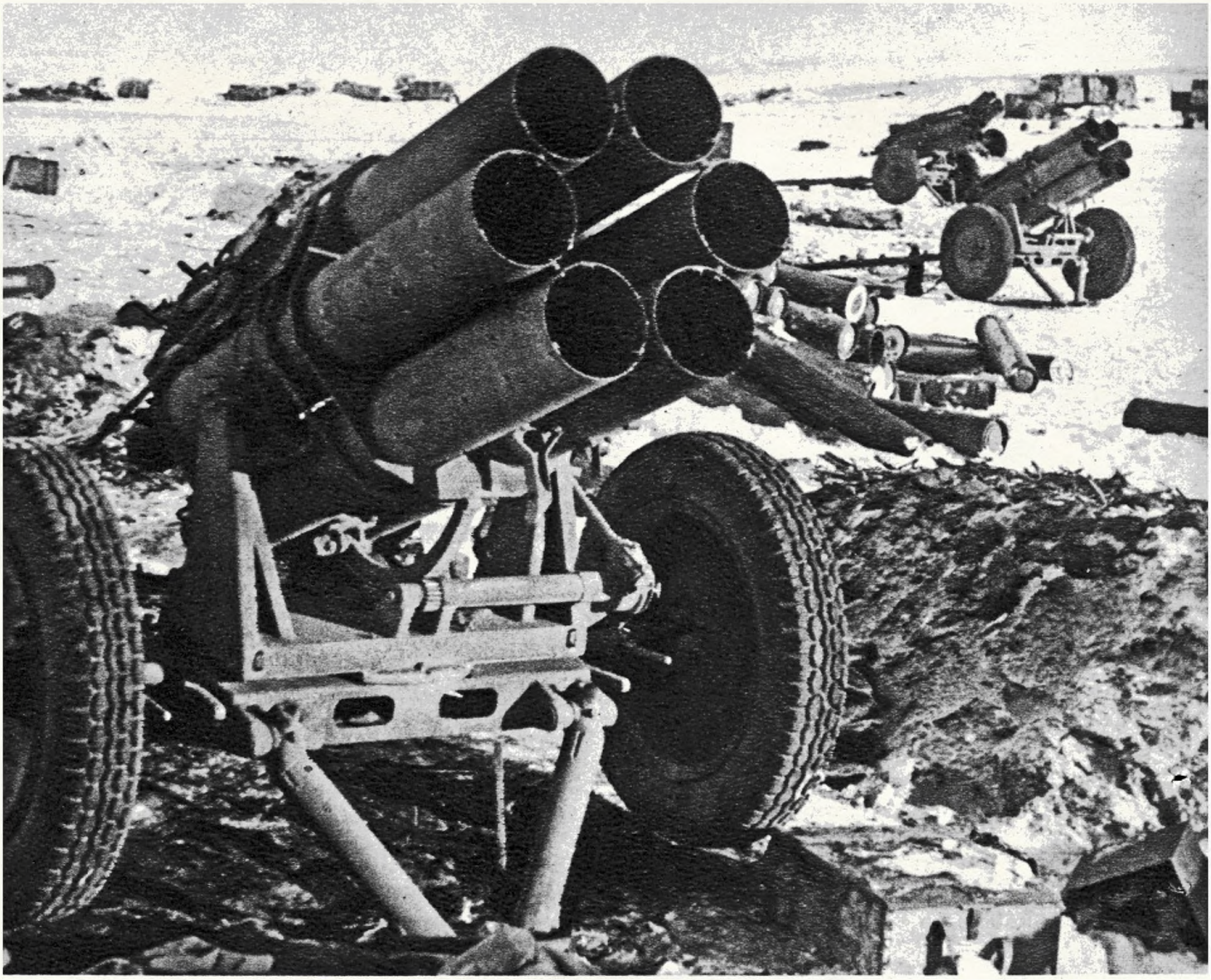
JET PROPULSION
POWER GENERATOR DIAGRAM

of the engine. Only recently has engineering design of such apparatus reached the necessary high level. This improvement in efficiency of blowers and gas turbines has, simultaneously, led to the perfection of practicable gas turbines, which similarly depend on compressor-blowers and turbines.

One of the most important features of the jet-propelled plane, and the jet engine, is that the extreme mechanical simplicity—the original engineering design problems are a long, long way from simplicity!—makes almost anything that will burn a suitable fuel. The present engines are designed for a fuel of about the character of ordinary domestic oil-furnace fuel; they could be designed readily enough to handle the heavy bunker oils used in industrial plants and steamships, powdered coal, charcoal, or anything handy that could be burned. It is advantageous, but not absolutely essential, to have the combustion take place in the direct line of the jet. It would be possible to design the apparatus to work with an outside firebox, burning solid fuel in grates, with the jet as the "chimney." The one essential of the jet-motor is that a mass of gas trapped between a breechblock—the compressor-blower—and a restricted jet orifice, be heated and thereby greatly expanded, forcing it to leave the jet at a far higher speed than it entered because of the increased volume. The hot gases leaving a bed of burning coal would do that job!

Best bet for the post-war world: 100 octane gas for automobiles; the planes will be burning kerosene, heavy bunker oil, or the like!

THE END.



The German nebelwerfer *six-barelled rocket-gun.* Sovfoto

Rocket Artillery

by WILLY LEY

***The** modern use of rocket weapons is determined by definite laws of payload, range, and accuracy. Ley suggests here the things rockets can and cannot do. And suggests—the "rocket-gun coast" isn't that!*

This is a war of four-hundred-mile-an-hour hit and run bombers, of 8000-pound blockbusters that look like railroad tank cars, of fighters that climb into the stratosphere to do battle, of eight-inch mobile guns that stalk their prey, of super battleships equipped with fantastic devices, of communication lines reaching all around the globe, of short-wave lies beamed across oceans.

But it is also a war of revivals.

The cold steel of the knife blade still counts. In Ethiopia an Italian garrison was set afire and the soldiers were smoked out not by means of thermite incendiary bombs but by means of fire arrows, shot from Senegalese bows. In Tunisia the Germans used airplane darts, precise imitations of the French airplane darts of 1914. In Libya they had an imitation of the Davis nonrecoil gun, made in U. S. A., vintage of 1917. The old high-angle siege mortar which fired exploding bombs when guns did not fire anything but solid shot is back on all front lines in a modernized and deadly version as trench mortar.

And the use of rockets is such a revival, too.

We know that rockets are older than guns. The first known report about war rockets is of Chinese origin, the year of their use is 1232, they may have been invented a decade earlier. The year of the invention of the gun is 1313, the place what would now be called Western Germany. During the century that intervenes between these two dates gunpowder and rockets had been brought to Europe. And for at least another century nobody could make up his mind whether guns or rockets would have the greater future or whether the best shooting weapon might not be the noble bow and the villainous crossbow.

The same discussion sprang up again five centuries later when the British General Sir William Congreve constructed war rockets which carried incendiary or explosive heads. Copenhagen was set afire by some twenty-five thousand of these projectiles in 1807 and in the field the Congreve rockets outranged—with a maximum of three thousand yards—and generally outshot any artillery piece that could be maneuvered in the field.

Artillery won again, as it had five centuries earlier.

Another century later—now—rockets and guns compete again, side by side and against each other. The Germans see their tanks blasted by "bazookas" in Italy and by rocket bombs on the Russian steppes. They saw their positions deluged with heavy rocket shells from the Russian *Katyusha*—("sweet little Catherine")—at Stalingrad. They fought back with their six-barreled rocket mortars which have a range of some six thousand yards. The Germans call it the *Nebelwerfer*—("Smoke Thrower")—but American soldiers in Sicily dubbed it Whistlin' Willie.

Another type, encountered for the first time in Sicily, is known as the 320-mm. incendiary rocket, con-

Artkino-Sovfoto

Massed rocket-throwers such as these helped the tough Russian defenders to end Hitler's hopes, and von Paulus' army, before Stalingrad.

sisting of a container of incendiary matter shaped like an enormous egg with a powerful rocket attached to it. Its shipping crate substitutes for a launching rack. The crate, after the outer covering has been removed, is propped up in such a way that an elevation of about forty-five degrees is produced. The large phosphorous bomb takes off with a great deal of smoke and flame when ignited but has a fairly restricted range.

The Germans also use a kind of rocket gun from fighter aircraft against Allied bombers, having learned a lesson in World War I when the French tied large naval signal rockets to the upright struts of their biplanes and used them with telling success against the hydrogen inflated observation balloons of the German artillery.

And just for good measure the Nazi propaganda agencies are busy spreading stories about gigantic rocket guns, capable of sending two-ton projectiles over a distance of one hundred and twenty-five miles. With these guns they promise to devastate London in retaliation for the activities of the RAF.

Rockets, no doubt, are back in

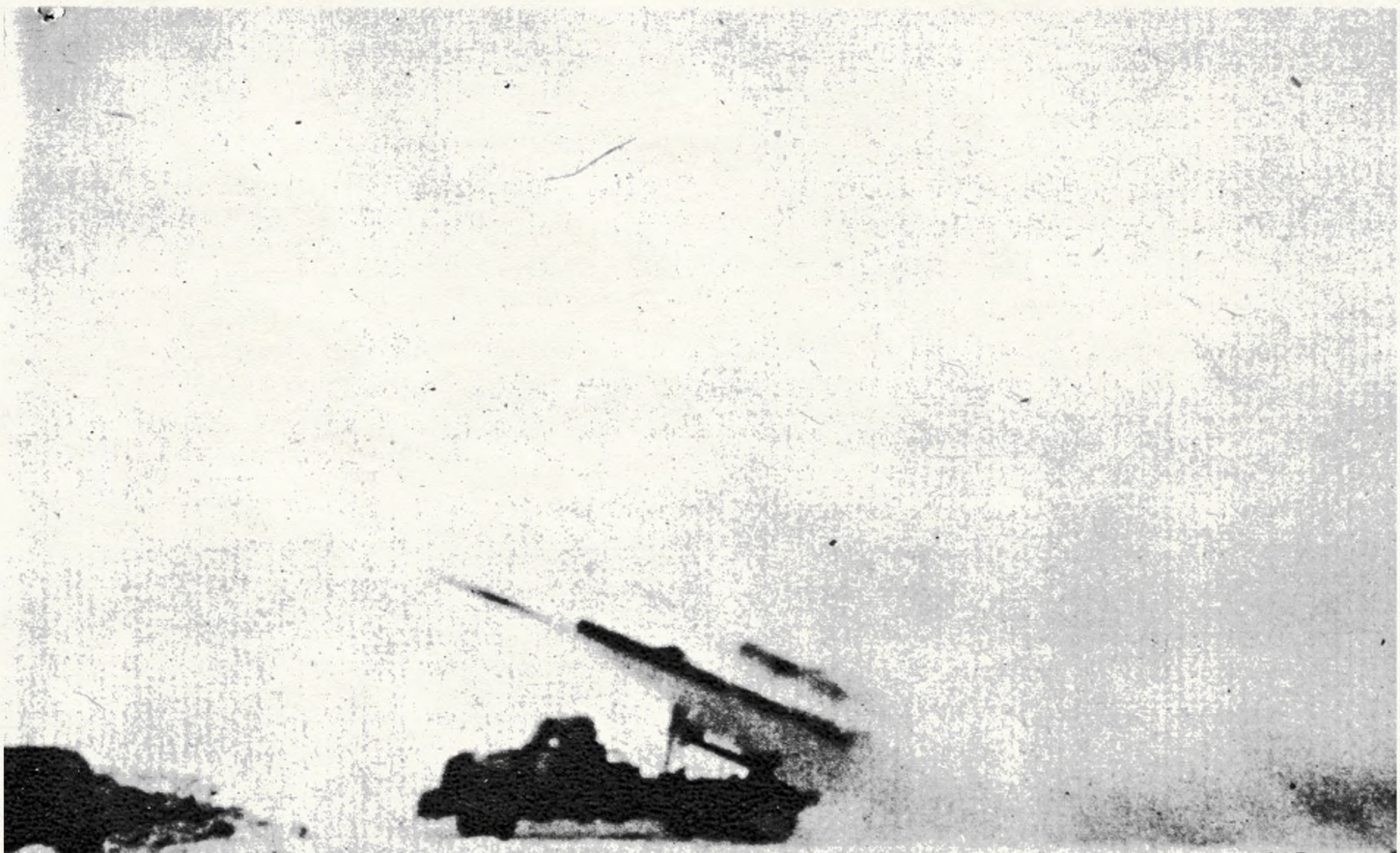
warfare, having been revived again after one century of inactivity. The question now is whether rockets are going to stay as weapons of war this time. Before the war started prophecies that they would came a dime a dozen, but neither the theory of rocket motion nor the realities of present warfare seem to lend too much support to these prophecies.

Most of them harped upon the fact that rocket theory states that there is no limit to the size of a rocket. And, consequently, that there is no limit to their theoretical range. If a rocket were heavier, it was said, it just required a larger propelling charge. Or if the "head"—the actual projectile—were comparatively light and fitted with the same large propelling charge the range would grow accordingly. One of these prophets spoke of rocket heads which would be the equivalent of 24-inch guns—if there were such a thing as a 24-inch gun—and another commentator claimed in all seriousness that the British had been intimidated by a demonstration of a long distance rocket carrying one thousand miles.

Both these things are theoretically possible, but the prophets and commentators neglected to make some fairly simple calculations to establish the quantities of rocket fuel required to move either the

Sovfoto

Truck-mounted, heavy-caliber rocket launchers of the Red Army, devastating as heavy railroad cannon, but mobile as a small fieldpiece, helped the defense at Stalingrad, and have helped on many another front.



International

The American bazooka is a two-man gun, as mobile as an infantry rifle, easy to hide, with a knockout punch that can stop any tank yet made.

weight of a 24-inch projectile or to attain a range of one thousand miles for any projectile. It may be remarked at this point that the projectile, in the latter case, must not be too small at any event since it would not have any noticeable effect if it compared, say, to the 33-pound shell of the 105-mm. howitzer. That famous 80-mile projectile of the German *Paris Gun* of 1918 weighed around two hundred fifty pounds. The gun, at the peak of its activity, was fired some eight times a day, landing a ton of shells on Paris. That frightened half a million Parisians into leaving the city then. Meanwhile people got used to such things, an air raid has to drop at least a thousand tons now in order to be described as "heavy."

But we'll stick to the shell of the Paris Gun for purposes of comparison. It weighed around two hundred fifty pounds, had a muzzle velocity of almost precisely one mile per second and attained a range of eighty miles, rising to a highest point of roughly twenty-nine miles, about midway between muzzle and point of impact. The propelling charge weighed two and a half times as much as the shell, a most exceptional case, since pro-

pelling charges normally weigh only one third of the weight of the shell.

The trajectory described by the shell was a part of a so-called Keplerian ellipse with one of its focal points in the center of the earth. Naturally the shell attained its highest velocity at the muzzle of the barrel, before gravitation and air resistance went to work on it. The caliber of the shell was approximately eight inches, but its dimensions are unimportant for this comparison, the figures that really interest us are the muzzle velocity, the range attained and the weight

International

The bazooka's caissons don't roll—they walk. The ammunition must be as mobile as the gun, if the fullest advantage of either is to be had.

of the projectile.

A rocket, in order to attain the same range, obviously would have to attain the same velocity. There is a difference insofar as the rocket travels while its velocity is still increasing, the effect is about that as if the barrel were not about one hundred ten feet—as in the case of that Paris Gun—but several miles long. This difference is very important as regards the strains on the projectile or on the things inside the projectile, but it matters comparatively little as far as the ballistic performance goes.

What interests us most is the amount of rocket composition required to speed a two-hundred-fifty-pound projectile on its way over an eighty mile range. The formula is fairly simple. It reads

$$\frac{M_0}{M_1} = e^{\frac{v}{c}}$$

where M_0 means the mass of the rocket before take-off, M_1 the mass of the rocket at the instant of arrival, $e = 2.72$, v means the highest velocity attained by the rocket which is the velocity attained at the instant the supply of fuel is exhausted, when it has, so-to-speak, reached the end of its imaginary barrel. The symbol c, finally, means the velocity of the rocket exhaust in reference to the rocket itself.

Of all these factors we know only v. It is one mile per second, the velocity the rocket has to attain. We do know c in a manner of speaking: by assuming a value for c which agrees with experimental evidence. For powder rockets of high compression c equals about one thousand yards per second. M_1 we know only partially, it consists of the two-hundred-fifty-pound projectile which the rocket is to carry and of the shell or tube housing the rocket composition. Mathematically speaking M_1 is larger than two hundred fifty pounds, how much larger is something we cannot even guess at the present moment because in order to estimate the weight of the shell for the rocket composition we first have to know how much rocket composition we need.

When I was confronted with such a problem for the first time—some seventeen years ago—I felt stumped. It looked as if you have to know M_0 in order to find M_1, but M_0 is what you want to find out. I spent several days in trying it out by assuming all kinds of values for M_0 in order to find one which would fit—only to realize in the end that all this work had been superfluous. What we want to know is not M_0 or M_1. Rather, we want to know that too, but what we want to know *first* is the *ratio* between these two. That is much simpler, it is, in this case, $e^{1.77}$. The result is a little below 6, for simplicity's sake we'll say that it is 6.

It means that the rocket at the instant of take off has to weigh six times as much as the rocket which arrives. Under these circumstances it is justified, I think, to estimate that the weight of the shell housing the rocket composition will be about the same as that of the pro-

British Combine

The British shipboard antiaircraft rocket, launched by pulling a trigger cord, carries a plane-fouling cable aloft, and releases a parachute at the peak of its flight, to hold the trailing wire aloft as long as possible.

jectile to be carried. In fact this is a very lenient estimate. M_1—empty rocket plus projectile—then weighs five hundred pounds. The take off weight is six times as high. three thousand pounds. The powder charge is about twenty-five hundred pounds. The powder charge in the Paris Gun was 2.5 times the weight of the shell.

Why does it need so much more powder to transport the rocket?

The explanation, in its simplest form, is this: During the first second of burning time a given amount of rocket composition is consumed, say ten percent of the total. These ten percent have to move—to accelerate, if you want to be precise—the projectile plus the rocket itself plus ninety percent of the rocket composition, that part which has not yet been consumed.

Still a rocket might very well be superior to a gun for a range of eighty or one hundred miles, simply because no gun is needed. The gun itself is, needless to say, the most expensive part of the whole performance. (The Paris Gun is said to have cost fifty million dollars.) Powder, on the other hand, is comparatively cheap. As long as the rocket is not too expensive—and there is no reason why it should be—the gun is at a financial disadvantage: the venture will cost more powder but much less money.

But I now hear the urgent question why I assumed powder as a fuel. With liquid fuels everything would be much simpler. For example with alcohol and liquid oxygen—liquid oxygen is the best "oxygen carrier" by far, everything else, every chemical compound, is greatly inferior—the exhaust velocity would be around one mile per second even if the rocket motor works but poorly. Correct. In that case the ratio would be 2.7 to 1 instead of 6 to 1. If you had a rocket motor which gets the full theoretical value of about two miles per second out of these fuels, the ratio would still be 1.64 to 1. But the best that could possibly be expected would be a ratio of about 2.5 to 1.

The reason for using powder in my calculation is that liquid fuel rockets have no military value. They lack the most important requirement for ammunition: storability. You can store powder rockets. You can amass the quantities required for a prolonged surprise bombardment of maximum intensity. But you cannot store liquid fuel rockets. You can store the alcohol, of course. You cannot store the liquid oxygen, however. And you certainly cannot store the charged rocket, you cannot even store a liquid fuel rocket charged with the alcohol only.

You might conceivably set up a fortress or a battleship-size vessel with a liquid oxygen plant. But that plant does not deliver liquid oxygen in any desired amount at a moment's notice. It needs at least twenty-four hours to cool itself sufficiently before it can produce liquid oxygen. And then it produces steadily, but the quantities are limited.

For military purposes it has to be powder for reasons of storability.

The 32 cm. German incendiary roc[illegible]t is shipped in a special crate which serves as the launching rack, wh[illegible] the outer wrapping is removed.

International

We now come to the next question.

Can a 3000-pound powder rocket be built?

No.

Can a 2000-pound powder rocket be built?

No.

Can a 1000-pound powder rocket be built?

If anybody can do it, he has failed to announce this fact.

As things stood at the beginning of the war the very largest that could be handled by a very few specially equipped factories was eighty pounds. It is not only unlikely that this figure has been doubled in the meantime, it is also unlikely that it can be doubled.

To sum up: long-distance rockets require large weight ratios. These weight ratios cannot be built with powder—unless somebody invented an entirely new principle which was nowhere in sight five years ago. The theoretical discussions which worked with the theoretically unlimited size and weight of rockets were correct as far as they went. But that theoretical limitlessness applies only to liquid-fuel rockets.

But liquid-fuel rockets are not storable. End of chapter.

On second thought I'll not end this chapter without a parting shot.

How about longer ranges?

For a 600-mile—1000 kilometer shot v would have to be about two miles per second. The weight ratio for a powder rocket would have to be 35 to 1. A 600-mile gun cannot be built any more. A rocket of such weight ratio, no matter whether for powder or for liquid fuels, would have to consist of at least two steps—one rocket carried by another—and that would ruin whatever accuracy it may possibly have had to begin with.

Beginning with a range of about one hundred fifty miles, bombers are cheaper by far, even if the planes themselves are lost. And bombers deliver much heavier loads than anything else beginning with a range of about fifty miles.

Since everything seems to have miscarried in the realm of long-range work we'll now go to the other end of the scale, to the shorter ranges of field artillery and the maximum ranges of trench mortars, anywhere between two thousand and six thousand yards. It is interesting to note that the maximum elevation of field guns and the minimum elevation of trench mortars is the same: forty-five degrees or half a right angle. This is the angle which produces the longest range for a given muzzle velocity, any steeper or shallower angle results in shorter ranges which, of course, may be desirable at times.

The fact that an elevation of forty-five degrees produces the longest range was established experimentally by an Italian engineer by the name of Tartaglia who died in 1557. A little later some formulas were developed to explain his findings. They are simple indeed. The formula for the peak altitude in a vertical shot reads $v^2/2g$. The

formula for the range attained with an elevation of forty-five degrees reads v^2/g. The highest point of the trajectory for the same shot is $v^2/4g$. Simple enough, unfortunately these simple formulas neglect air resistance. And the formulas which include air resistance are such that they make even a mathematician hesitate a little.

But experiments have shown that air resistance plays a comparatively minor rôle if the projectile is heavy and the muzzle velocity low. This can best be shown by two tables, comparing the calculated and the actual performance of an old mortar. The piece used was a French 220-mm. mortar, Model 1887. It fired projectiles weighing 118 kilograms—roughly 260 pounds. The smallest propelling charge used was one of 1.135 kg.—2.5 pounds—which produced a muzzle velocity of 90 meters—about 300 feet—per second. The largest charge used weighed 6.126 kg.—13.5 pounds—producing a muzzle velocity of 230 meters—about 760 ft.—per second.

TABLE I for v = 90 m/sec.

ELEVATION (degrees)	RANGE (meters)	TIME (seconds)	ANGLE OF IMPACT (degrees)	VELOCITY OF IMPACT (meters p. sec.)
(65°15′)	(628)	(16.7)	(65°15′)	(90)
65°15′	600	16.6	66°31′	88
(34°2′)	(766)	(10.3)	(34°2′)	(90)
34°2′	750	10.2	35°1′	88

TABLE II for v = 230 m/sec.

(66°22′)	(3961)	(43.0)	(66°22′)	(230)
66°22′	3200	40.7	70°2′	206
(35°0′)	(5067)	(26.9)	(35°0′)	(230)
35°0′	4300	25.9	39°23′	195

In both tables the figures in () refer to calculated values, the next line to the actual values obtained. It will be noted that the difference between calculation and actual result is much smaller in the first table, so small, in fact, that the error made by the gunner in estimating the range is apt to be larger than the difference between calculated and actual ranges.

Interesting as this is, the weight of the projectile and that of the driving charge interests us even more. Just accidentally the weight of the projectile is almost the same as that of the long-range shell discussed earlier, simply because that old French mortar happened to have the same caliber as the Paris Gun. The propelling charge varied between the two extreme cases of 2.5 and 13.5 pounds.

To attain a velocity equal to that of the muzzle velocity for the heavy charge a rocket would require a mass ratio of $e^{1/3}$ or $\sqrt[3]{e}$ which is about 1.4. The ratio for a velocity corresponding to that of the light charge would be about 1.15. Expressed in figures the rocket would have to weigh $260+25\times1.4=399$ pounds in the one case and $260+20\times1.15=322$ pounds in the other. Two hundred sixty pounds is the actual projectile, twenty-five and twenty pounds, respectively, the assumed weight of the housing of the rocket charge.

Again, even in the case of such short ranges, the propelling charge of the gun is far superior, the advantages are all with guns, including that of accuracy.

This explains why the Congreve War Rockets of one hundred thirty years ago disappeared, but it does not explain why rockets are now back in the field, as *Katyusha*, *Bazooka* and *Nebelwerfer*. If guns are so superior in accuracy and so much more economical in gunpowder consumption, why did anyone bother bringing rockets back into the field?

The reasons are of another nature as those discussed so far. It is not a question of superior efficiency from the engineering point of view, it is, so-to-speak, a question of military convenience in the field.

The military advantages are:

(A) Rockets do not need guns but only guiding devices, like a launching rack—Katyusha—or thin-walled launching tubes — Bazooka, Nebelwerfer. Consequently rocket batteries can be put into positions into which artillery could not be put, since in the case of rocket batteries it is the ammunition which comprises the main weight, not the guns. The smallest of them, the Bazooka, can be carried by one man, if necessary, and the same man can carry a number of rounds.

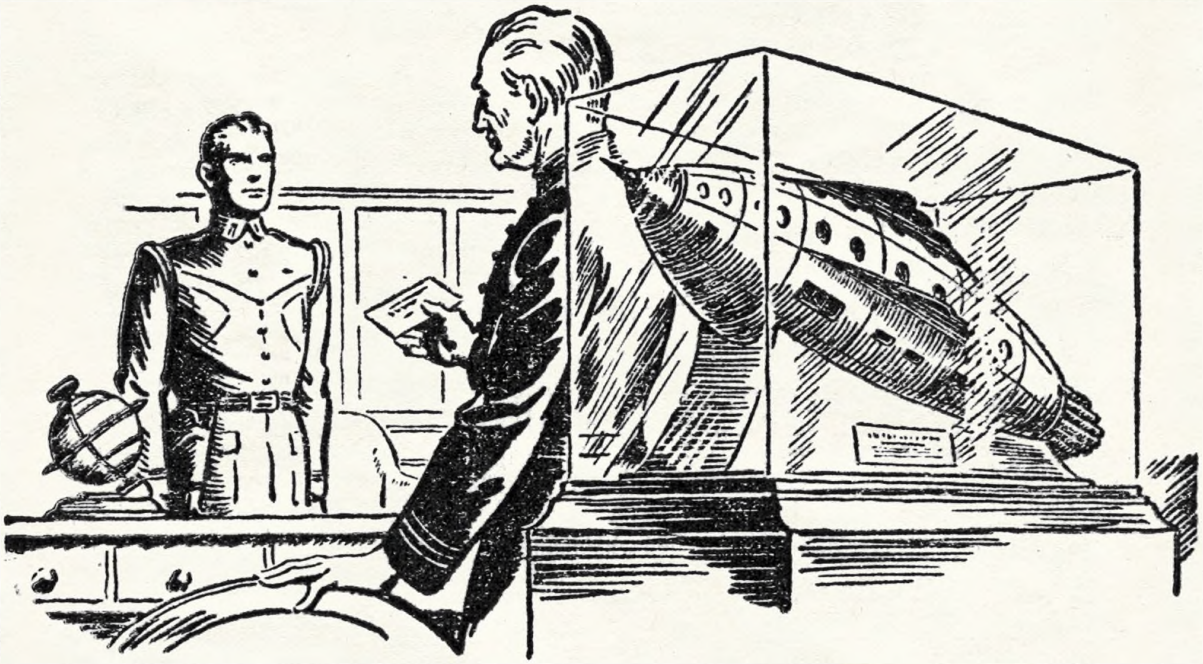
(B) Rockets do not exert any recoil when ignited. For this reason it is possible to fire a comparatively heavy projectile from a shoulder weapon like the Bazooka. If a projectile of the same weight were fired with equivalent velocity from a gun, the gun would have to be mounted on wheels or in some other manner since it would weigh too much to be fired from the shoulder. Even if it were light enough to be fired from the shoulder, the soldier could not stand the recoil.

(C) While rockets are far less accurate than artillery it is in many cases possible to make up for lack of accuracy by volume. This applies to both the German Nebelwerfer and the Russian Katyusha. The Nebelwerfer can discharge all its six barrels in as many seconds according to Russian reports, while the Katyusha fires complete salvos of a dozen rockets or more. This is a far higher rate of fire than could be delivered from a gun firing projectiles of comparable weight.

And these are the three reasons why rockets are back in the field. They can serve where volume is required more than accuracy of fire—a more accurate rocket weapon like the Bazooka does not attain a similar volume—; they can serve where the weight of the piece might be a handicap; they can also serve where the recoil of a piece might be a handicap.

THE END.

The Bureaucrat



by MALCOLM JAMESON

***Bullard** was a Grand Admiral now, and the red tape of high position bound him—they thought!—so tight he couldn't do a friend a favor. But what's a knowledge of high strategy for but to outmaneuver trouble?*

Illustrated by Orban

Though the mills of God grind slowly,
Yet they grind exceedingly small—

The young man strode through endless corridors with the confident bearing of one sure of his right. Most of the guards who stopped him were satisfied with his ident and the uniform he wore. To those who doubted he tossed the formula he had tested earlier and found to work.

"I am bearer of a personal message to Grand Admiral Bullard," he would say, and hurry on as if already late.

That sufficed to pass him through the many red tape wound barriers of the vast Defense Building in the bowl of Tycho Crater. It worked well even in the first half-mile of the northwestern wing. But when he came up to the partition where

hung the sign "Chief of the Bureau of Spatial Strategy," his boldness began to ebb. Facing him, seated at a receptionist's desk, was a grim-faced, battle-scarred three-striper. And he wore the aigulettes of a personal aide.

Young Benton slowed his pace, and tried to gauge the man who now sat athwart his way. The rows of iridescent ribbons on his breast and the golden shoulder loops indicated that he was no ordinary receptionist. He was on Bullard's staff probably because he had fought many a campaign by the side of that fabulous man himself, and surely had access to his senior's mind. No flimsy generality was likely to get by his guard.

Benton faltered. He bore a message, to be sure, but the man it was for was hardly more to him than a legend, while the man who had given it to him had been dead for five years. Would the admiral receive it after so long a lapse of time? More immediately, could this gold-laced Cerberus be convinced he would? Young Benton realized then how forlorn was the hope that had brought him to the Moon.

He braced himself. There was a war on—the first important one since his coming of age—and he wanted to take part in it, even as his father and the renowned Bullard had in those before he was born. He *had* to get in it, and there was only one card left unplayed — the ace-in-the-hole bequeathed him by his father. Perhaps Bullard would turn him down, even as they had in Personnel, but he had to make the try. His career, his self-respect hung on it.

"Sir," he addressed the guardian of the door, "I am the son of Captain Roy Benton, who was killed off Io in '93—"

"I knew him," nodded the commander gravely. "A good shipmate and a brave fighter." He paused, then added, "Well?"

"He told me once," said Benton, uncertainly, "that if I ever got in a hole so deep that I couldn't see the light, and had done everything I knew how to get out and failed, I was to go to his old skipper—Bullard—if he was still alive, and tell him he sent me."

The commander was studying the young man with hard, expressionless eyes.

"You choose a moment in the greatest war in history to get yourself into a jam," he said, coldly, "and then expect the busiest man in the System to stop what he is doing and bail you out. I knew your father, and I do not believe he gave you any such message. He, like the admiral, helped only those who help themselves. You misunderstood him."

"Oh, no sir," cried Benton. "It's no ordinary jam—he told me I would have to weather those under my own power. But this is different—I'm up against a system. Oh, sir, can't you see . . . it's nothing *I've* done, it's something being done to me . . . I want to get into this war, I want to fight, and they won't let me!"

The grizzled aide relaxed the

grimness of his expression. There was no doubting the sincerity of the eager youngster before him.

"The admiral is very busy," he said, "but if you're sure you're right—"

The commander turned as if to send in a message on the teletype, but apparently instantly thought better of it.

"Wait," he said, "I'll tell him you are here."

Young Benton stood stiffly as he had been left, tense and ill at ease, staring at the shut door. Until that moment he had thought only of his own troubles, not in the least as to how they stacked up in the perspective of stellar affairs. Now that his name had gone into the grand admiral he was a little appalled at his own temerity. For to him Bullard had been rather a legend than a reality, and in his despair young Benton had forgotten that he was a great deal more than a mere former shipmate of his dad. He was the director of all spatial strategy, a power who sat aloof like a dim deity, dealing only with fleets and flotillas, issuing orders that moved men by the million to violent action and sometimes death. Now that he was on the threshold of his office, the sickening doubt assailed Benton that the great man could not possibly find time to receive him or hear his story.

The aide was gone a long time. As Benton sank onto a chair and waited, the enormity of his act of thoughtless intrusion was borne in with frightening force. For the anteroom behind him had filled up with a score of officers of flag rank —minor admirals and commodores —each laden with bulging brief cases, and each intent on seeing the bureau chief. The withering looks they gave him spoke their impatience. Benton reddened under their hostile stares, and then at last the commander came back.

"Sorry, commodore," he said crisply to a glowering, walrus-mustached old officer who rose irritably as if to dash inside, "but the grand admiral is not free yet. You will have to wait."

As the florid commodore sat down sputtering, the aide turned to Benton.

"Go on in," he said.

Elation surged up in young Benton. He was in! He was inside the door and up onto a motor scooter piloted by an orderly.

"You had best ride, sir," the orderly had said, "it is quite a way yet."

But as the machine slid swiftly along gleaming passages, Benton saw that the private suite of the grand admiral was no small place. Through door after door he glimpsed tremendous activities. Occasionally they whizzed through open bays of desks where scraps of conversation could be overheard, while all about were annunciators flashing weird symbols incessantly.

"Sector 4," droned a voice, "*Pegasus* and *Altair* joining action. . . . *Pegasus* hit. . . . *Pegasus* blows up. . . . Cruiser Flotilla 36 moving in from lower port quarter. . . . *Altair* hit—"

As that faded, the orderly cut

across the back of a balcony overlooking a great hall. Far down in the pit Benton could see a huge swirling ball of vapor, glittering with pin points of varicolored lights cast upon it by unseen projectors. That would be the ultra-secret Battle Integrator—the marvelous moving solidograph that resolved six dimensions into four. Stern-faced officers watched it intently, snapping orders into phones, and uniformed girl messengers dashed everywhere. Then Benton was out of that place and passing other wonders.

Long before he reached the door that actually was Bullard's, Benton was a limp and chastened young man. Now he knew that the personal grievances that had brought him to the Moon were infinitesimally petty, as petty as the effrontery of his bringing them to harried Bullard's attention was colossal. His own place in the grand scheme of things now appeared as unimportant as the gyrations of a single atom in an ocean of brine. Benton was wondering whether it was still too late to apologize and make as graceful a withdrawal as possible when the scooter skidded to a stop before the paneled door.

"In there, sir," said the orderly, and was gone.

Grand Admiral Bullard received his visitor standing. He was tall and spare, as his pictures always showed him, and he stood beside a glass case in which rested a model of the famed *Pollux,* the ship in which he and the elder Benton had begun their climb to the top. Only the deep lines in his face and a thinning white mane hinted at his age. He smiled gently and offered his hand.

"I couldn't refuse to see the son of my old friend Benton," he said, "but I'll have to ask you to make it brief. You are in trouble?"

"I'm turret officer in the *Vindictive,*" said Benton, "and can't get off."

He stopped. That told the whole story—if one knew him and also the gilded madhouse in which he was doomed to "serve."

"The only *Vindictive* I ever knew," said Bullard, shaking his head, "was a clumsy old monitor, but she was scrapped years ago."

"It's the same one, sir," said Benton. "They've pulled her off the junk heap and put her back in commission."

"Brief me on the *Vindictive,*" Bullard said into an annunciator, jabbing at a button. "Let me have it by five."

He glanced dreamily past Benton's head, where unknown to his young visitor a succession of cryptic signals was being flashed in pale light. The code characters told the admiral that Benton was a graduate with honor of the Lunar Academy with six years excellent service behind him, including a commendation for behavior during the Patroclan Pacification campaign. Amazingly the series ended with the symbol "Sp-A1-Duration," which signified to Bullard that his present assignment was at the personal direction of the Secretary of Defense and

was not to be altered for the duration.

"You don't like your duty?" queried Bullard mildly, but with a slight frown.

"I hate it!" said Benton fervently. "It is in a turret that cannot be fired, mounted on a ship that goes nowhere, and nobody else on board gives a—"

He broke off, reddening. He had almost committed a breach of one of the oldest sections of the Service's unwritten code. Short of reporting outright treason, one simply did not peach on shipmates, however unworthy.

"That is, sir, I'd like more active duty," Benton went on, floundering for his words. "My skipper laughs at me . . . says I don't know when I'm well off. Personnel refuses to answer my letters. . . . I even tried to desert . . . engaged an expert camofleur so I could enlist under another name and start over . . . but it didn't get by the doctors . . . he couldn't fake the eyeball veinings well enough."

Benton looked glum, then broke out fiercely.

"They laughed me out of the place and sent me back to the ship . . . now the fellows call me the Boy Scout of the Void—"

Bullard simply stood and looked at him, saying nothing.

"Oh, it's my mother, sir," Benton wailed in a torrent of pent-up anguish, "she's changed so since dad went . . . she says she won't let them make cannon fodder out of me . . . and she has money enough to make it stick. It's that fortune from dad's ship detector . . . she goes to all the bond rallies with Ungerhardt, the Minister of Finance, and buys in denominations of ten millions. She got him to work on the secretary and stick me where I am . . . made me into a lily-fingered slacker. Can't you see the spot I'm on?"

"That's bad," murmured Bullard, and sighed. Wars had to be financed, and if two cabinet ministers had already interfered, Benton would have to reconcile himself to being a personal sacrifice. Huge building programs were more important than the ambitions of any single young man. Bullard knew that if the secretary had already taken a stand, his own intervention would accomplish nothing.

"Young man," he said slowly, "your case is one of thousands. In a war of this magnitude there must be many square pegs in round holes. Unhappily there is no time to investigate and rectify each separate injustice. I would like to have the miraculous powers you credit me with, but it would be improper—and I am afraid useless—for me to interfere in personnel affairs. My job is to handle ships, and not even single ships as I once did," and he gave a loving glance at the gleaming model of the *Pollux*, "but whole forces and vast fleets. They are scattered from the dim reaches of trans-Plutonia to the fiery wastes of the circumsolar sector. I do not know half the commanders of them by name, let alone what is happening on board their vessel. I am sorry to let you down,

but there is nothing I can do for you as an individual."

"Yes, sir," said Benton, miserably. Now he was getting it—the old brushoff. It was being administered in a kindly way, but nevertheless that was what it was—the brushoff.

"You must remember," continued Bullard, "that I am no longer a free agent. I am the impersonal entity known as the Bureau of Spatial Strategy. I cannot act in terms of individuals or even single units. My orders must apply to all ships alike. I am what is known as a bureaucrat, and bureaucrats are a notoriously callous lot. My advice to you is to return to your ship and be the best turret officer you know how. It may be that useful work can be found for her—"

"She is quite useless, sir," said Benton.

"We'll see," said Bullard, and smiled. He offered the young man his hand again, signifying the interview was terminated.

"I am a cog in a vast machine, no less than you," Bullard added. "Bigger and better placed, perhaps, but circumscribed as to function. Rest assured that my bureau will look into your case, and if action is indicated will act—but always as a bureau. I hope you understand."

"Thank you, sir," mumbled Benton.

After that he hardly remembered how he got out of the place. On the way back he hardly noticed the disgruntled brasshats he passed. They were coming in for their belated appointments, and glowered at him, wondering what business a mere cub could be on to gain him immediate access to the chief. As for Benton, he knew only that for all his polite reception he had got exactly nowhere. He was still of that dismal opinion when he reached the outer door. There the veteran aide regarded him gravely, dead-pan as before.

"What luck?" he asked.

"I . . . don't . . . know," said Benton, gloomily. "He didn't promise anything."

What happened next puzzled Benton for hours. The aide reached over and patted him affectionately on the shoulder.

"Tough," he said, with all solemnity. It was not the word spoken nor the friendly gesture that astonished Benton. Perhaps any old shipmate of his father would have done the same. It was the slow, deliberate wink that accompanied them. It was such a sly and knowing wink!

Benton went the rest of the way to where his skyster was parked in something of a daze. Try as he might, he could remember nothing that Bullard said upon which he could pin hope. There was not a thing he could sink his teeth in. And yet—well, he could not forget some of the yarns his dad used to spin. The gist of them was that when it came to Bullard one never could tell.

The ponderous machine ground on. For a moment a tiny cog had wobbled on its shaft and brushed a great driving wheel, but the tinkle

of its impact was hardly heard. Yet the contact was sufficient to enmesh a train of hitherto unused gears. Silently, efficiently, they took up the impulse imparted to them and passed it on. At the appointed hour a segment of the machine whirred briefly and spewed up a bit of grist.

"The report on the *Vindictive,* admiral."

It was Captain Shipstead, paunchy and bald.

"Vindictive?" puzzled Bullard. His afternoon had been full. "Oh, yes."

"What good it will do you, I can't imagine," wheezed Shipstead. "She stinks."

"As bad as that?" queried Bullard. Now what young Benton had intimated was coming back to him. "What are the high spots?"

"Greed and cowardice in about equal parts, and opportunistic weak-spined officeholders for the rest. It's one of those things that probably will be probed and exposed after the war. Maybe. I don't know. The BI boys have given it a pretty good going over, and it scared 'em. They think the dope too hot to hold, so they buried it deep in their files. I almost missed it. But I can tell you that if you are planing to use the old tub she's a total loss."

"So I was given to understand," said Bullard dryly.

He took the report and riffled its pages. It was the not new story of avarice and fear and subtle bribery, the bribery of political and economic pressure. Certain rich young men feared the draft with its harsh policy of no exemptions. Some were merely playboys who did not want to be annoyed; many were able and energetic, but busy making vast profits out of the war; there were others who were just plain yellow. But their ends were the same. They pooled their immense resources and found the answer. It was the monitor *Vindictive.*

The Bourse, that aggregation of money and commodity exchanges that dotted the landscaped dreamland of Manhattan, was the most vital spot in all the seven planets. It deserved protection, and it petitioned for it. It wanted a warship to hover over it and guard it night and day—a big warship. When the request was refused the Bourse retaliated. Bond sales languished and procurement found commodities scarce and high. It was Ungerhardt, the Minister of Finance, who unblocked the impasse. If no major warships were available, why not recommission one of the very old ones? Wires were pulled, and the Defense Department saw the light. The *Vindictive,* to be manned and operated by local boys, was the outcome of it.

"I suppose," said Bullard wearily, "that to fight a war someone has to think of where the money and supplies come from. Still—"

"We aren't out a thing," said Shipstead. "The ship is little better than a museum hulk and the crew are even more worthless—as helpless a bunch of stuffy brokers and lazy lounge lizards as could

be assembled. I would trade the lot of 'em for one good, upstanding young man of the type we use."

"Exactly," said Bullard, thoughtfully.

"You can't touch 'em," warned Shipstead. "The ship is on special duty, subject only to orders of the secretary himself."

Bullard smiled.

"And I thought you were a good sky lawyer!"?

He pulled open a drawer of his desk and abstracted a document of parchment from which dangled the great golden seal of the Grand Council.

"My precept of office," he said. "Read it."

Shipstead took it, skimming down through the well-known paragraphs.

"Mm-m-m," he mumbled, pursing his lips, "this part, you mean? —'and as chief of said Bureau you shall be responsible for the state of training of all vessels in full commission, whether acting singly or in fleets, and to that end are empowered to prescribe drills, make inspections, and'—?"

"As good a take-off point as any," smiled Bullard. "I knew I'd find something in that directives. Now let me think what I will do with it."

He stared dreamily at the ceiling for a moment.

"There's no way to make 'em fight," he said, "but we can make 'em work. Maybe we can make 'em mad enough to want to fight. Shipstead, take an order!"

Shipstead scribbled down the few words dictated.

"That's all we need to start the ball a-rolling. Send it to all ships and notify Operations. After that I think we can just let nature take its course. If I know the type, they'll yell and start pulling wires. The more they squirm the worse it will be for them."

Captain Shipstead snapped his notebook to and chuckled.

The war machine never rested, nor did it delay or question. What was fed into it it took up and bore along relentlessly. Its inertia was great. Once a train of impulses was passed on into its throbbing vitals, not even its nominal director dared tinker with it. It was too intricate.

Young Benton leveled off and savagely clicked out his code designation, as pasted on the dashboard. The hovering guard ship sent back the expected answer. There was no other in its vocabulary. "Permission granted to proceed." Benton noted it and put the skyster into a deep dive. He had complied with the empty formalities that were supposed to justify the presence of the fearsome looking *Vindictive*. But he had done it full of scornful rage, for no one knew better than he how toothless was the barking wardog. For all the stumpy old sky monster's mighty katatrons and gaping tubes, she could neither move nor shoot. Tugs had brought her there, tugs would have to take her in when the war was done. But he, like the masters of other passing vessels, observed the pleasant fic-

tion. It was better to slow and answer the challenge than to receive endless letters from the Office Stratotraffic Control.

Benton dived on down onto the broad sky field of the Cosmos Club, landed neatly, and turned the borrowed yacht over to a flunky. That done, he rapidly mounted the club's swanky terrace. He loathed the place, and those who frequented it, but that day it had served his purpose. He had at least been able to shoot his last bolt, whether or not it had hit the mark. Now there was no other course open to him but to go back to his ship and try to follow the hard advice Bullard gave him.

He managed to avoid most of the lolling guests—many of them shipmates, as he knew from the glint of gold on their left breasts. For the shameless ones had gone so far as to wangle a special campaign badge—the Tellurian Defense Medal—whose ribbon was cloth of gold. Benton had to wear one, too, but he did it with characteristic protest—scorning gold he bought one of plain silk ribbon, *yellow.* He was across the terrace and almost to the outer entrance when a slim young man with a tiny waxed mustache stepped out from the bar and detained him.

"Aw, haw do ye do, Benton," he drawled, in languid condescension, "Are you going up? If so, will you be good enough to tell the 'Zec I shawn't be up for a day or so—social obligations, ya knaw."

Benton scowled. The fellow could have phoned as well. They usually did. But Commander Van Draem—one of *the* Van Draems—had more to say.

"Meet yoah new assistant, . . . Reggy Torrington, Benton. He'll be up shawtly and be yoah helpah—"

"In doing what?" glared Benton, ignoring the flabby hand. He had nothing in particular against Reggy Torrington, except that he was just one more idler, scion of the founder of the Plastics Trust. His draft number must have come up.

"Haw, haw," snickered Van Draem. "Don't mind Benton, Reggy . . . not a bad fellow, reahlly . . . a bit touchy about oauh inactivity and all that, the ungrateful beggah—"

Benton did not hear the rest. With curling lip he was on his way to the door. Outside it he grabbed a crosstown autocar and hit for the landing stage. There had been a time when he looked forward to making port in Manhattan. Not any more. For real ships came in from time to time and disgorged their weary veterans for a few hours on Mother Earth. Benton could not bear to look into their space-bronzed faces or overhear their bantering chatter of engagements they had survived. Most of all he dreaded meeting an old acquaintance, whose cheery, "Hiya, boy, what ship?" could not be answered without pain.

No one was at the landing stage but Purcell. Purcell was his classmate, the only other regular on board. It was not being of a rich family that had caused his shang-

hailing to the *Vindictive,* but grim necessity. A slacker's haven need not be able to cruise, but those aboard it must have light and heat and water. A competent person had to see that the auxiliaries ran, and that was the hard lot that fell to Harry Purcell. He liked it as little as Benton did.

"How did you make out?" he asked, as soon as they were in the boat.

Benton shook his head.

"He saw me. Was friendly, but said it wasn't his pigeon."

"Bullard did that?" said Purcell, incredulously. "Why I always heard—"

"Yeh, I know," said Benton, disconsolately. "Oh, I don't blame him. He must have a lot on his mind—is getting old, too. He said I was to think of him only as a bureaucrat, and reminded me what they were—"

"Say," said Purcell, brightening, "now that's not a bad idea, at that. I wonder what one of those stodgy bureaus would be like if a man took hold and ran it like Bullard used to run the old *Pollux?*"

Benton did not answer. His gloom was too deep, and already the boat was bumping the ship's side. He got out silently and clambered into the monitor's air lock.

He did no more than glance into the luxuriously appointed wardroom. There was no other in the skies like it. In reconditioning the ship money had been lavish as to living quarters. But that afternoon there were only a few officers lounging in it. Of the handful obliged to stay on board the others were either in their bunks sleeping off last night's round of the hot spots down in town, or in the communications shack parleying by phone with their floor traders. Benton noted that the time was six, and started for his own room to make ready for dinner. It was then a messenger overtook him with the news that the commander wanted to see him.

"Me?" Nobody ever asked Benton about anything. He was a misfit, for all his mother's money. It took several generations of great wealth to produce the perfect parasitic type that mainly manned the *Vindictive.*

It was Farentz, the Executive, who had sent for him. Farentz was a corporation lawyer and a good one. In Captain Dobson's eyes he was exactly the kind of man to handle the detail of running a ship, involved as it was with the endless red tape of departmental procedure. Dobson himself rarely came up from the great banking institution he headed.

"You understand this jargon," said Farentz, handing over a flimsy. "What does this mean in ordinary English?"

It was a message from the Department, not ten minutes old.

ALLPAT URGENT:

Amend Art 44 Tactexins as follows quote vessels mounting katatrons Mark VII to Mark XXIX inc shall be deemed cruisers for purposes of Tactical Exercises unquote acknowledge

1728 SPAST.

"It is from the Bureau of Spatial Strategy," Benton said, "to all ships. It modifies a certain article of the Instructions for Tactical Exercises, putting katatron ships in the cruiser class."

"Humph," said Farentz. "We mount katatrons—Mark XX's. I looked it up. What does it mean?"

"It means that we will have to perform the same drills cruisers do, I suppose." Benton's eyes suddenly went aglow. Could this be the fruit of his visit so soon? On the face of it the message seemed innocuous enough, and yet—

"It is absurd to talk of drills for us," said Farentz. "We don't know how and we haven't time for it. According to our understanding with the secretary we are exempt from such foolishness. I shall ignore this."

The messenger was back. He handed Farentz another flimsy. It read:

VINDICTIVE:

Ref SPAST ALLPAT 1728 your Form 1000 interrog expedite

OPS.

Farentz frowned.

"This one is for us," he growled. "What does *this* double-talk convey, if anything?"

"Operations," translated Benton, "says that since we are to be regarded as a cruiser, they want our Form 1000 and want it PDQ. That, I believe, is our operating schedule—for full acceleration test runs, target practice, and so on."

"Nonsense," snorted Farentz. "We are on detached duty. I shall protest it."

"Say over open ether that we can neither cruise nor shoot?" grinned Benton. "Their comeback would be that it was high time we learned to do both."

"Of course not," snarled Farentz. "I shall protest on the ground of discrimination. That multiple address is camouflage. Some busybody is sniping at us. No other ship had katatrons."

"Except," Benton reminded softly, "the other ten of this class—the *Relentless,* the *Implacable,* and the rest."

He knew those old relics were too far gone in rust to be reconditioned, but nevertheless there they were. Benton smiled happily at the ingenuity of the ALLPAT message. SPAST had the reputation of never backing water. If pushed, they would undoubtedly say that they *contemplated* putting a division of monitors in the air. The cruiser rule would stick.

Farentz evidently realized that too. He pulled a communicator to him and jabbed savagely at buttons.

"Get me Captain Dobson at Tellurian Trust," he snapped.

Benton could hear the rasping diaphragm bring back Dobson's voice. He was unperturbed, soothing. Pay no attention, he said, it was probably a slip of some clerk. They couldn't do that to us. He would see Ungerhardt in a day or so, and Ungerhardt would fix everything. Acknowledge the messages and send in a schedule. It didn't

matter. It would be washed out later."

"All right," said Farentz, before cutting the connection. "I'll have Benton cook up a plausible schedule and send it in. Then we'll forget the whole thing."

"Righto," came Dobson's cheery voice.

Benton went to work on it in high glee. The one he had in mind was not impossible but it was stiff—a program calculated to sweat the champagne from the pampered darlings that made up the monitor's crew. He had no way of knowing whether Bullard's hand was behind those two messages, or what his own role was supposed to be, but to him they brought golden opportunity. And hope.

For Benton knew what Dobson and Farentz did not—the virtual immutability of schedules once submitted. They were routed through many offices and were the bases of much planning. They were fitted into more comprehensive fleet schedules, which were fixed months in advance. Last minute alterations were intolerable. One lived up to his schedule or explained why. By the time Dobson's complaint reached the secretary too many bureaus would already be involved, and omelets are not easily unscrambled. The *Vindictive* was committed to whatever Benton wrote down, and she dared not squeal. Her situation did not bear airing.

Benton sent off Form 1000 with a smile. Once it was in the works there was no stopping what would follow. Drills would have to be held, and he and Purcell, being the only ones who knew how, would be the taskmasters. It was a lovely prospect. Of a sudden service in a retired monitor began to have appeal. Then Benton sobered. The realization smote him that he did not know the first thing about kats, and it was high time he learned.

He took the gleaming corridor that led forward, then an elevator to the topmost through deck. After that it was a case of climbing ladders until he popped up through the hatch in the turret floor.

He was in the cubicle from which the turret officer directed the service of the two mighty projectors. Its bulkheads were a maze of dials and meters and queer antiquated gadgets few of whose uses he knew. On either side stood intricate switchboards, and beyond those he could see into the turret proper. That large space was packed with towering banks of accumulators, exciters and boosters, and weird-looking massive solenoids of greenish metal. Benton had never seen them but once before—the day he joined the *Vindictive*. He learned then that all that massive equipment was no better than mere sham. The power leads to it had been cut.

He stepped into the turret for a closer look. As he did there was a stir at his feet and two startled skymen sprang to their feet. They had been sprawled out playing acey-deucey.

"Sorry, sir," said one, a stocky

man with iron-gray hair and the scars of deep burns on his face, "we never knew an officer to come up here before—"

"That's all right," said Benton. "There has been a change. Beginning tomorrow we start drills. Can you show me around?"

The man smiled. He was Handley, Chief Electronicist, and wore the red and purple medal of the Fourth Battle of the Asteroids, the one in which the *Vindictive,* then queen of the fleet, blasted the Callistan flag into nothingness.

"I fought these guns in my first hitch," he said, "though I was just a lad then, a switch-puller. I remember, though. She's ready to ride if we only had juice and a hundred good men."

"Tell me all about it," said Benton.

He listened. There was nothing wrong with katatrons. Except for their ponderousness and slow rate of fire there was no better weapon. They had become obsolete because the trend had been to handier, faster acting guns. It took the accumulators minutes to build up the vortices of naked atomic power, but once they were hurled nothing known to man could stand in their path. Between shots the ship was helplessly vulnerable, a fatal disadvantage in a multiple engagement. Advanced thought preferred a continuous blanket of fire, albeit less intense.

"We can drill, yes," said Handley, "but shoot, no. When they installed the Ekstroms they severed the cables and cut the generators over to power them. We can hover or we can shoot. Not both. We'd drop like a stone."

The monitor had been built for tube drive, but tube ships could not hover. In renovating her for her special job, Ekstrom repulsors had been installed, drawing their current from the generators designed to power the kats. Thus she could maintain her position in the stratosphere above Wall Street at the price of offensive power. There was not room for two sets of generators.

"What's wrong with cutting out the repulsors and using the old tubes?" Benton wanted to know.

"Nothing," said the other man, a first class tubeman from his rating badge, "except they've been blanked off to make room for the j.o. mess. They had to put all those ensigns somewhere, so they put them in the rocket feed flat."

"Oh," said Benton. That was a feature he must look into with Purcell. After all, propulsion was Purcell's job. He was the engineer.

When Benton left two hours later he felt considerably cheered. If some drastic changes could be made, the ship could be brought back to something like fighting trim. The crux of the problem was not that. It was personnel. Instead of the normal complement of a thousand men and half a hundred officers, the proportions were reversed, and few of the officers had ever soiled a hand or done work more vigorous than lifting a highball. From that angle the prospects of converting the monitor to a fight-

ing ship were not bright. Lots of pressure would have to be applied from somewhere, and he knew it would not come from Dobson. Benton bemoaned his own low rank.

Despite the opening the two messages seemed to afford, he felt powerless to make the most of it. The powers of obstruction were too great.

He found a council of war going on in a corner of the wardroom. Captain Dobson, big and hearty and every inch a financier, had come up to straighten out "this foolishness." Farentz was pawing through volumes of regulations, hunting for loopholes through which to crawl. Van Draem, annoyed at being sent for, sulked nearby. The secretary, it developed, had regretfully told them he had done all he could for them. He promised they would continue to do duty as sentinel ship for the Bourse and not be sent to the front, but to arbitrarily excuse them from routine drill would be embarrassing to him.

Dobson took it sourly. It meant he would have to relinquish his money-broking and give full time to his command. In the same manner it would hit many of his associates.

"What is the least number of men you can make a showing with, Benton?" he demanded. "It appears we will have to go through with this farce."

"Battle drill is an all-hands evolution, sir," said Benton quietly. "I have already made out the station bill. Unfortunately, having so many . . . uh, untrained officers, and so few competent men, I have taken the liberty of reversing their roles. The officers will man the guns, the veteran petty officers direct."

"That's outrageous," declared Van Draem.

They also thought it outrageous when Benton suggested sending out a general recall. There were not bunks enough to bed all the officers nominally attached. They wouldn't understand what recall meant.

"Use MP's," said Benton, "and when your excess officers come aboard they can double up. Later, when we get the old tubes uncorked and ready for firing, the

ones who live in the feed flat will have to double up again."

"We'll make no alterations," said Dobson flatly.

"You're the skipper," said Benton, shrugging. "At your direction I filed a firing schedule. Somebody will have to think up some good answers as to why we can't carry it out."

Dobson grunted, and looked hopefully at Farentz.

"When you've got no case," said the lawyer, "the next best thing is delay. I haven't read all this stuff, but tomorrow I ought to find something."

"Good," said Dobson, and rose. That was that. Now he could go down to his bank again. Blundering bureaucrats! Paper warfare was a game two could play at!

A machine does what it is designed to do. A little overload does not stall it. Let the grist run even and the pressure remains the same. Let a stubborn lump jam the rolls, the pressure rises.

Lieutenant Commander Carr was a determined young man who had a desk in Operations. To him *Vindictive* was just a name, one of the eight hundred odd ships that came under his supervision. No one had given him special instructions concerning her; no one had to. The routine of preparing vessels for battle had been crystallized generations before him. There were certain things required to be done and in certain specified ways and at such and such times. His job was to see that they were. It was as simple as that.

"What an outfit!" he muttered, glaring at the letter on his blotter.

"Now what?" asked McGinty, his deskmate.

"This old crock of a monitor they dug up to stand guard over the Bourse. Militarily she's a gag, but somebody over in SPAST evidently didn't know that. They classed her as a cruiser and have got her down for target practice. What's hard about that I don't know, but it seems to have upset them."

"Yeh?"

"First off they said it violated the safety precautions to fire kats that hadn't been used for years, and protested being included in the rules until they were dismounted and proved again. Well, Captain Shipstead appointed a board of inspection and ran tests on 'em. Said they were O. K. Then they complained they couldn't cruise for lack of motive power and that it was unsafe to fire the kats so close to a city. Atomic Engineering sent down a man and fixed 'em up on that. Tore out a lot of gingerbread fancy officers' quarters and uncovered a flock of old rocket tubes. Didja ever bump off in one of those space buckers? Boy, I did, on my first training cruise. They're *rugged.*

"Anyhow, between SPAST and ATENG they convinced 'em they could shoot and they could mote, so their next holler was that they were on fixed post and couldn't desert it to go out on the range. That

squawk came to me. They had it backed up with a solemn declaration signed by about ten thousand brokers that if the Bourse went unguarded the worst panic in history would develop. It stumped me at first, as no real warships could be spared. Then I discovered that all they do is lie there and log passing ships. So I sent them and the brokers a message saying that adequate relief would be furnished at the proper time. Any tug will do the trick."

"That should have held 'em," remarked McGinty.

"You don't know that crowd," snapped Carr. "I'm beginning to think they are a lot of slackers or something. They're afraid to shoot. Well, they're *going* to shoot, and clear out by Mars if I can find a target vessel out there. Listen to this concoction of some sky-lawyer."

"Your attention is respectfully called to Article 724, Instructions for Tactical Exercises, which states that no turret crew shall be stationed for drill or action except as prescribed in the appropriate *Drill Manual.* Diligent search on our part has failed to turn up a single copy of any manual relating to the service of Marx XX katatrons—"

McGinty grinned.

"They've got something there. Those babies are obsolete as the dodo. I wouldn't know what to do with a pair of 'em myself. They used to backfire, you know, and wipe out whole ship's companies."

But Carr still glared grimly at the document. To him it was one more alibi, and he didn't care for alibis. He dragged a communicator to him.

"Publications," he said.

No, Publications told him, the Manual of the Katatron had been out of print for several decades. Had he tried the Library?

No, Library said, they had available only current material. Who cared a hang about katatrons anyway? But maybe Archives could dig up something.

"Archives? Ops speaking, Carr. Have you anything on katatrons? Yes—k-a-t-a-t-r-o-n-s—a sort of atomic bomb projector . . . used to put 'em on monitors. What, only one and that can't go out? Rot! . . . send me up a hundred certified photostats."

He shut off the communicator.

"That ought to hold 'em," he said between his teeth, "I'll send 'em ninety-nine and keep one for personal boning. Then I'll take a run down and check 'em against the book. They asked for it. Those lads are going to shoot or my name's not Jimmy Carr."

A day came when the little sky-cutter *Gnat* came up and hove to five miles off. She was equipped with a two-way stratophone, a one-inch Angborg blitzer, and manned by eight husky guardsmen. That was the *Vindictive's* temporary relief, and Dodson gazed upon the little can sourly. A pressboat came up and circled the pair while grinning omnivox commentators made ironic notes. The status of the *Vindictive* had come to be an open secret, and there were signs that

her immunity to the perils of war were near their end.

During the four hectic months that preceded that day, Benton and Purcell often had reason to regret the change they had first hailed with delight. Various bureaus of the Department hammered them from the beginning with queries and tracers. Tart inspectors came and went. The pressure on them was relentless, and the more Dobson and Farentz squirmed, the more severe it became.

The problem of the two regulars was man power. Numbers they had, but the quality was negligible. Because the ship's complement was hopelessly padded with supernumeraries, drills were run in three and four sections, night and day. Benton and Purcell would hit their bunks exhausted, buoyed up only by the grim satisfaction of having run the soft playboys ragged another day.

But there were surprising by-products. Benton discovered that his first judgment had been overharsh. Several hundred of the brokers, forced by the gruelling schedule to remain on board and work, severed their last business ties and put in for front-line duty. As one of them put it, if they had to be full time in the war they might as well do it up brown. Astonishingly, a letter of commendation came along, praising the *Vindictive* for its success in training men. There were others, such as Reggy Torrington, who, having worked for the first time, suddenly discovered it could be fun. They became interested and looked forward to the day when they could see the results of the weeks of grinding drill. But there were still the Van Draems, the group of snobs who resented everything that was done. Those Benton drove the hardest.

Then four great tugs came and locked tractors on. They towed the clumsy monitor far out beyond the orbit of the Moon, then kicked her off into space with a mighty heave. Her momentum would carry her the ten million miles to the practice area, and on the way she could try out her renovated tubes without fear of a misfire and falling out of control on the city.

Benton and Torrington were crouched over a curious device in the turret booth. It was a miniature version of the Battle Integrator, a series of transparent concentric spheres cunningly illuminated by fingers of light from a projector in its nucleus. Benton indicated a crawling pink dot.

"That's us," he said. "When we get to point A Purcell blasts off with everything he has and from there to B we accelerate full power. By the time we get to B you should have recovered from the acceleration shock and manned the thermoscope. The target will be somewhere in the zone CQTV. This curve shows its heat characteristics. The minute you pick it up, cut in the tracker and put on your alert light. Get it?"

"You bet," said Torrington. "Then when do we sock it?"

"As soon as we are in comfortable range. I'll do that. Mean-

time I have to give a hand with the astragating. Dobson simply can't learn."

In conn the captain and Farentz studied the black visiplate studded with stars. Both wore full spacesuits, and both were uneasy.

"I don't like this, Farentz," said Dobson, "it's murder."

"I did the best I could," said Farentz, sullenly. "But when you're up against a stupid bureaucracy—"

"We weren't so bright ourselves," muttered Dobson. "This old hulk is a deathtrap."

Unnoticed and not understood, little green lights had been popping out on the indicator board. Purcell was reporting his tubes as they were ready. Dobson ended his remark with a careless gesture, the back of his hand struck a stud. Instantly the lights went out as with a shattering roar twelve huge tubes aft exploded into action. The vessel leaped forward with a spine-wrenching lurch, Dobson and Farentz reeled across the room, smashing into the control panel. Gouts of wicked electric fire spat, and something in the upper corner burst with an ear-rending shriek, then broke into lazy flame.

"This is it," moaned Dobson.

"What's this?" asked Benton sternly, staggering in. He felt for the auxiliary lighting switch and snapped it on. Then he swiftly set the disturbed panel to rights and grabbed a fire extinguisher. Putting out the fires was but the work of a moment, after which Benton faced the cowering captain and exec. "When you don't know what to do," he said, "do nothing. What are those spacesuits for?"

"We may have to abandon ship," said Farentz, sheepishly. "If there's a backfire—"

"If there's a backfire, there won't be any ship to abandon or anybody left to do the abandoning," said Benton coldly. "You had better call yourselves sick like Van Draem has done and go to your rooms. I'll handle things."

He strode out of conn and down the passage toward the motor room. The premature blasting off could easily have done damage. Purcell hadn't realized the dangers of throwing control to incompetents.

As Benton went aft he noted with growing apprehension the weaving of the old hull. Paint and metal polish had conspired to conceal the monitor's defects. Now, as the heavy tubes thudded out of synchronism, vibrations wracked the ship. Rust was a poor structural binder. A bulkhead split with the noise of a cannon, a minor cable parted with a flash of blue fire. Four overhead lights went out. Benton quickened his step.

"Alert your damage control parties," he warned Purcell hastily, as soon as he found him. "There will be plenty of fireworks when the kats let go, if we don't have 'em sooner. I'll be in conn; Dobson and Farentz are there, but in a blue funk. Our only hope for a good showing on the range is that Reggy will remember all I told him."

"The kid's all right," admitted

Purcell. But he looked worried. One tube flickered and went out, then relit with a crash that jarred. The entire motor room was a confused mess. Monstrous cables festooned the now by-passed Ekstroms, since the ship was driving ahead under real power, carrying the powerful generator currents over to the first-stage accumulators of the katatrons. The wild disorder of the makeshift changeback offended Purcell's engineering eye, but the jury rig was the only one possible. Only by taking the Ekstrom repulsors out of the ship altogether could the motor room be restored to its former trimness.

A gong began sounding. That meant Reggy had found the target.

"I've got to run," yelled Benton, and darted back toward conn. As he dashed through the corridor past Van Draem's room, he glimpsed that worthy's shaky form. He was pale and scared all the way through as overhead ducts and pipelines rattled in their hangers. He was doing his best with fumbling fingers to climb into a spacesuit.

"The yellow rat," thought Benton, but he did not pause. A steady hand would have to be at the controls when the kats went off. And it was well he foresaw that, for when he reached conn the place was empty. Dobson had already fled.

Benton's hands flew as he rectified the set-up, then he growled savagely on noticing that somehow the telecontrol had been activated. He ripped the connection loose and saw that he was safely back on local. Then the turret line crackled.

"Coming on, coming on," chanted Torrington's talker. "Ten seconds to go. Stand-by. Five seconds to go . . . four . . . three . . . two . . . one—"

No machine can do everything. A mechanism can only deal with the material fed it. But if it is cleverly designed it will reject that portion unsuitable for the finished product.

Excerpt from log of Observing Officer Langhorne in target control ship *Alferatz:*

1036: SST *Vindictive* coming on range, wobbling badly. Appears to be having trouble keeping tubes firing evenly.

1045: Ship appears to be under better control since it manages to stick fairly close to base course. Probably will complete firing as per schedule as target now should be within detector range.

1108: There appears to have been an accident on the monitor. An escape boat has just shoved off and blasted away. Boat very badly handled, operator probably being injured.

1117: Halo now visible about discharge knobs of monitor's katatrons, indicating discharge imminent.

1118: *Vindictive* fires both kats.

1123: Both bolts hit, target vessel demolished. Am sending well-done, despite poor approach.

1136: Can't understand what is going on on board *Vindictive.* Has there been a mutiny? There was a boat left the ship just before the turret fired. Now there are eight more boats streaming in the monitor's wake. Yet the vessel goes on under full tube blast.

1140: Something is radically wrong. *Vindictive* bucking in fashion impossible to account for, jumping in great oscillations at right angles to its trajectory.

1147: *Vindictive* disappears!

A later entry:

1758: Last of *Vindictive's* boats recovered. On board were the captain, executive, gunnery officer and numerous junior officers, all in advanced state of shock. Surgeon diagnoses reaction as acute fear, but stories told so far incoherent.

1930: Pattern of story of survivors now emerges. It appears that ship began to disintegrate upon initial firing of tubes, whereupon captain and executive abandoned without waiting to ascertain cause of or extent of damage or passing the order along. They were accompanied only by the gunnery officer, Van Draem, who states that he was on the sick list and knows nothing about the disaster. Occupants of the other boats seem to have stuck to the ship longer, saying they saw nothing amiss until the turret blast. At that time the ship was plunged into total darkness and was a hell of hissing gases, spouting water lines, and tangled steel. Electric fires broke out all over at once, and it was by its light that the last surviors unloosed the remaining boats and escaped. According to them there were a number of men and officers still on board at the time of the ultimate disaster, one Lieutenant Benton being senior. Nothing is known of their fate. It is noteworthy, however that no enlisted men escaped, and few of the more junior officers. It is hoped that the hulk of the shattered *Vindictive* be found—if it exists anywhere—so that a complete investigation can be made, as this is undoubtedly a unique disaster.

2015: Complete report sent SPAST and acknowledgment received. Directed to place all survivors under arrest and charge with poltroonery. Then search hyperspace for monitor."

Benton did his best to hang on to the periscope. Reggy Torrington's closing of the firing circuits had been timed to perfection; Benton wanted to see the result. It was not possible. The frightful jar that accompanied it was more than he could withstand, and he was hurled from his saddle. Then there was utter blackness and the fiendish crackling of millions of internal discharges. They were harmless—the *Manual* had warned against them—a mere adjustment of stray static, but apt to be disconcerting. Yet even as he pulled himself erect again Benton knew there were more things wrong with the ship than that. She was writhing and groaning far worse than before, and with it came the nerve rasping noise of high pressure air lines ruptured and water mains broken. Being already on emergency lighting and that now gone, he had to stagger aft as best he could by the glimmering aftermath of myriad short-circuits. He stopped on the way to try several communicators, but it was not until he reached the fourth one that he found one that worked. Reggy's voice answered wavering with excitement, but under control.

"We hit, we hit!" he yelled gleefully. "What a splash of fire! It was beautiful."

"Swell," commended Benton, remembering it was due. But that was ancient history now. "How are things where you are?"

"Not too good," said Reggy. "Fire all over the place . . . no lights for a minute . . . pandemonium generally. But the boys are going at it now. We'll be O. K. in a little bit."

"Stick to it, big boy," said Benton, heaving a sigh of relief. At least he could forget the turret. Things about him were otherwise. While he was talking a big blaze

burst out and the flames from it were licking down the passage. The damage-control party fighting it were licked. They fled screaming, tossing their tools away, and at the moment Benton did not dare tear himself away from the communicator. When he could be dashed after them, cursing them and ordering them to stand and regain their nerve. But they beat him to the boats, and when he reached the cradles he saw that all the other boats were missing. That meant that if they went away but half loaded a good third of the crew had already gone.

He shook his fist at the departing streaks of light, then turned back to the inferno within. The going was far harder now, for the ship was bucking like a broncho, making it all but impossible to proceed without acquiring burns and bruises at every turn. He kicked a limp, waterless fire hose out of his path and picked up one of the discarded extinguishers. With a few squirts from that he shortly had the frightening blaze out. Then, shielding his face against the pungent after fumes of smoldering insulation, he fought his way on toward the tube room. It was at that point that his senses left him. A bright nova seemed to generate itself inside his head, swell into a firebloom of intolerable dimensions, and then abruptly go black, leaving nothing. After that was a featureless eternity.

The time Benton was out was actually less than five minutes. He came to of himself, sat up and blinked. Conditions about him, if anything, seemed more normal. Some of the lights were back on and the ship had steadied again to normal pulsation, not the wild antics before total chaos took over. Benton clambered to his feet and went on to the motor room. He found it a hive of activity with Purcell flying about issuing hoarse orders.

"Oh, hello," grinned Purcell, seeing him. "I was about to send out a search party for you. Thought you might still be out from the jolt."

"I'll say it was a jolt," said Benton. "What happened?"

For answer Purcell pointed at the tangle of cables embracing the dead Ekstrom.

"Something we didn't figure on, since no sane person ever tried the hookup before. Regenerative effect, I suppose. Those first fires and such that we had were natural enough, the age of the old bucket considered and the rough firing we did down here. It was the current running through those leads to the kats. They built up a strong variable field about the Ekstroms and tickled 'em into putting out a kick even though they weren't getting any current directly. That explains the rough stuff between the first blast off and Reggy's pushing the turret button. What happened right after that was due to the backlash from the kats, which we knew about and were prepared for. What was bad for us was that the communicators were all shot for awhile and Reggy couldn't get

through to me. I didn't know the target had gone bye-bye and was feeding in another charge. It was just about ripe for letting go when Reggy said the show was over as far as they were concerned up there, so I cut the switch. Well—"

"Well?"

"There was a lot of back surging, I guess, along those cables, and the Eks went crazy. Kicked us around at about umpty gravs, and then started to melt. We all went blotto for a second or two, but we snapped out of it in time to take charge again. I thought something out of the way might happen, so when I pulled the switch I yelled 'low bridge'. We were all set here, so didn't get bunged up like you must have."

Before Benton could say anything to that the communicator from the turret was calling. He snapped into the line and picked up Reggy's voice.

"Say," demanded Reggy, "do you know where we are? About forty million miles straight up toward Polaris, and going like a bat out of Himmlerland. You'd better use your influence with Purcy to reverse course or we'll be clear out of the system in no time."

"O. K.," said Benton, well satisfied. Reggy had turned out to be a pretty good skate.

"I'm already bucking the momentum," said Purcell, who had overheard. In four hours we'll be on the way back. After all we've taken I hesitate to pile on more G. By the way, any casualties?"

"Uh, huh," grunted Benton. "Our three brasshats and a hundred or so of lesser talent. Took to the boats right off."

"Good riddance," remarked Purcell, indifferently. "Couldn't take it, eh? Well, we had too many hands anyway. Give me seasoned hands, like these here," and waved comprehensively at his grimy and sweating black gang. The nearest pair looked up and grinned, but did not stop working. One was "Pikky," until lately a famous crooner and generally despised by the he-man breed. Benton almost failed to recognize the other. It was Arthur Ungerhardt, son of the Minister of Finance.

"Nice work, all around," congratulated Benton. He had to go back to conn and complete the reorganization of the ship. He should send off several messages, too. That is, if the communications shack was still intact.

It is a mistake to think that faulty products should invariably be scrapped. Culls may be reworked and put back into the mill with profit. Severe testing has revealed that much rejected material eventually meets all specifications.

There were five assorted admirals, two commodores and a captain in the group.

"But who would have thought they would try to sneak in raiders that way?" growled one. They were looking at the big Battle Integrator whirling and sparkling in Action Hall, not a hundred yards

from where Bullard's quiet office was.

"The unexpected, you know—" put in the captain. "Luckily we had scouts out."

"Yah," spat the admiral. "Boys to do a man's job. Six *Vixens,* and along come four maulers. All right. The Scouts disintegrated two, but now there are two left and no *Vixens.* What's to stop 'em from coming right on in? There's nothing heavy enough this side of Mars, and that's five days off using everything."

They stared silently at the tell-tale ball of mist. High up toward its pole eight dull red marks were dying out, remnants of the blasted ships. The ships were gone, but the after-radiation lingered. Inside them and several degrees down two silvery blobs were crawling slowly. A pale thread of violet light throbbed in the fog, and on it the two blobs lay like pearls on a silken thread. The violet line was their computed trajectory. Its lower terminus was the Moon, Tycho Crater, in which sat the great Defense Building.

"What the—?" murmured a commodore. A pinkish streak of light appeared like a short-tailed comet, out of the nowhere, slowed, brightened, and then condensed to a definite point of glittering light. Instantly the computers in distant rooms noted it, and with flying fingers punched its observed co-ordinates into their machines. A second later another violet thread appeared —the mysterious pink body's course. It lacked little of intersecting that of the two maulers."

"There just can't be any cruisers way up there," said a bewildered vice admiral. He was the Operational Director of the cruiser force and knew.

A loud-speaker began to blare.

"The ship just appearing in Sector L-56 Plus 9 Zone is the ex-monitor *Vindictive,* engaged in target practice. She was propelled there as the result of a mysterious accident. Believed to be damaged and only partly manned. When last seen katatrons were still in working condition, but there are no experienced officers on board, her captain and others having abandoned her—"

"Great balls of fire," ejaculated the commodore. "There goes our hope—"

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"She's going in," said the vice admiral grimly. "She'd better be good. Here, messenger—"

He bit the summons in two, frowned, then strode toward a booth.

"I remember now," he muttered. "She has one of those telecontrols. I'll work her myself."

The elegant young dandy who had been so effective in challenging vessels approaching the Bourse was not in the communications shack. His spacesuit was not there either. He had gone with the other cravens. Benton seated himself and stuck in a jack. He called Operations and began a report of what had occurred.

"Top priority," broke in a voice, and Ops faded. *"Vindictive?* Cut your telecontrol in on this wave length. We're taking over from here. Are your kats still working? Very well, listen. Start building a charge and stand by for action. Two enemy maulers in your vicinity. They must be destroyed regardless of cost. Got that? Very well, give over and I'll guide you."

"We can't, sir," lied Benton. "A fire in conn destroyed it. Give me the dope and I'll take her there by hand."

There was nothing wrong with the tele, but everything was wrong with trying to explain. The teles would control the tubes, to be sure, but no one knew what the Ekstroms would do after another dose of induction and wobbling fields. Benton and Purcell's own knowledge was imperfect, but they had at least weathered one taste of it. Therefore in that respect they were one up on the admiral, though it would be tactless to say so. Admirals in a hurry were not prone to discuss things.

"What's that?" snapped the admiral, then grumblingly gave the course and co-ordinates.

Benton plotted swiftly, and barked orders to the tube room and turret. Gleeful voices answered. They had been through the worst now—the unknown. Anything that might happen hereafter they could take.

"Take your time," warned Benton. "They've already met opposition and are wary. That means that they are spread out, looking for more. With any kind of luck we can bop 'em off in succession."

"Watch it!" yelled Reggy. "I've already got one in the 'scope. Cheerio!"

Benton took the precaution to strap himself to the saddle that time, and swallow an anagrav tablet. He hoped he wouldn't go out at all between salvoes.

It was well that he had, for as the needles crawled across his indicators the *Vindictive* went back to her bronco tricks. It was sickening. Benton's fingers danced over the studs, adjusting the blast of this tube and that, strictly according to feel. Purcell had agreed to let him worry about equalization; he would keep them firing. Then he heard Reggy's happy "Coming on—stand-by!" the last seconds of counting, and the awful crackling as the static filled the ship in the wake

of the parting atom bombs.

"Got him," Reggy reported jubilantly, three seconds later, and Benton dived hard. A cluster of greenish fireballs was growing in the screen—slow but deadly projectiles launched by the defunct raider before he was hit. They were coming faster now, as their rocket drives built up.

"Cut kats," he yelled into Purcell's line.

It had worked once. Maybe it would again, despite the partial melting of the repulsors. It did. In no time flat the *Vindictive* was somewhere else, her crew reeling and groggy. Benton pulled himself out of an incipient blackout. He opened full the Luna wave.

"One down," he reported succinctly, "but where are we now?"

"Holy Comets," came an astonished voice from far away Action Hall. "We thought you went together. You disappeared at the same time . . . hold on . . . we see you now . . . you're over in L-31 and a Zone closer to us. How in thunder did you—"

"Never mind that," replied Benton crisply. "Have your experts slip me the geodesics to the next intersection. We don't know where we are or what we're making, but from wherever it is we can do five gravs—eight, if necessary."

"Attaboy!" came back the admiral's voice. "Hang on—I'll have it in a jiff."

Circumstances were merciful. Only four gravs were required, the Eks having lost some of their kick.

"We can't pull that one any more," Purcell reported mournfully on the ship interphone. "The Eks have folded."

"We won't need to," said Benton, cheerily. "There's only one more."

"Oh, that," sniffed Purcell. "I was thinking of landing when we get back. It won't be tidy."

"Last target coming up," sang out Reggy Torrington. "Wing shot, or aimed."

"Aimed, you fool," growled Benton. "Who do you think you are?"

"The best kat gunner in any man's Patrol Force."

"Next to Handley," reminded Benton, with a chuckle, "all you do is pick 'em out for him."

Shortly after that they were on their way home, the only vestige of the fourth raider a fast thinning cloud of cooling vapor behind them.

The great machine shudders and grumbles momentarily as it bites into a bit of obdurate matter, then whirs on. Its wheels go round and round, and the light glints from the teeth of silent running gears. But it is not a simple machine. Cams introduce variations.

The *Vindictive* lay in the main repair dock on Luna. Her strangely mixed company stood in ordered ranks on the floor of the crater, dressed in such motley of uniform and dungaree as survived the interior holocaust. A party of departmental bigwigs had just gone through, reviewing them. They were heroes, was the consensus.

Benton and Purcell had to follow the inspecting party into the battered hulk of the ship. The secretary was of the party, as was the chief of spatial strategy, the director of operations, the vice admiral in charge of cruisers, and others. They were amazed at what they saw. Ships of that era either went out in a blaze of shame or glory or survived intact. Here was one that had won a battle against odds without a scratch, yet was all but a wreck inside. The commander of the cruiser force fingered the telecontrol in conn. It was in perfect working order. He had been cheated of credit for the victory.

"You had better be glad," remarked Bullard, softly, reading his thought. "That boy does better when you give him his head." He coughed. "With reasonable restrictions, of course."

The board of electronic engineers came up from the tube room. They had completed their inspection and had held a powwow.

"That hit-and-vanish technic is hot stuff, Mr. Benton, even if a little daring," said their spokesman. "How did you come to think of it?"

"I didn't," said Benton, crisply. "It happened, that was all."

"Well," said the gruff old admiral who handled Ops, "at least you had the brains to use it once you saw how it was done."

"Mm-m-m, tough on the ship, though," grumbled another brasshat. He was chief naval constructor and was going to have to foot the bills.

"Not necessarily," objected the principal electronicist. "The stunt was improvised. Now, if we redesigned the ship for it—"

Benton and Purcell listened respectfully in the background. Now that pretty speeches had been made to them and medals hung about their necks they were ignored. The Powers that Be had noted the incident of the *Vindictive's* fight, dealt out the punishment and rewards that were due, and promptly consigned it to history. Now they were looking ahead.

"Tear out the tubes entirely, I say," the electronicist continued, "and put in high-power propulsors of the Rodriguez type, with a bank of modified Ekstroms located so that the . . . the uh, *Benton* effect, for we may as well call it that . . . can be had in any degree or intensity desired. Then—"

The discussion went on. The hull was to be strengthened by the addition of new structural members; in the light of later advances most of the bugs could be ironed out of the kats. When the old *Vindictive* took the void again her original builders would never know her.

Then the formalities were over, leave papers handed out, and the men dismissed. The officers strolled across the crater floor to the clubhouse where lunch awaited. Old Admiral Bullard fell in beside young Benton. As they walked and throughout luncheon he was in a reminiscent mood, chatting about the old days in the *Pollux*.

"Opportunity," he observed, toying with a tidbit and not looking at

Benton at all, "is largely what you make it. Young officers come to me from time to time complaining of disagreeable duty. But I make it a rule to never accede to their requests."

"Oh, yes, sir, I know," protested Benton, "but after all—"

"I still say," said the grand admiral calmly, "what I said. The day you called on me some time back I told you I had nothing to do with personnel. In that instance it was not merely a polite excuse. In view of the very peculiar circumstances I was tempted to make an exception. As it turns out it was well I didn't try to."

"Oh, yes sir, and that is what I want to—" Benton attempted eagerly to say. He owed Bullard thanks for something, though for the life of him he did not know just what.

"As I was saying," said Bullard quietly, overriding the interruption, "it was well I did not try. Today I proved it. For the first time I spoke to the secretary about you. He told me plainly that he wanted no suggestions from me. In short, your request has been duly conveyed—and turned down. Here it is officially."

He handed Benton a sheet of paper, and then lit a cigar. On the paper were these words:

From: The Secretary of Defense,
To: Lieutenant Commander Roy Benton,
Subject: Orders.

1. Upon completion of repairs to the super-monitor *Vindictive* you are ordered on board and in command, this assignment to be effective for the duration of the war.

THE END

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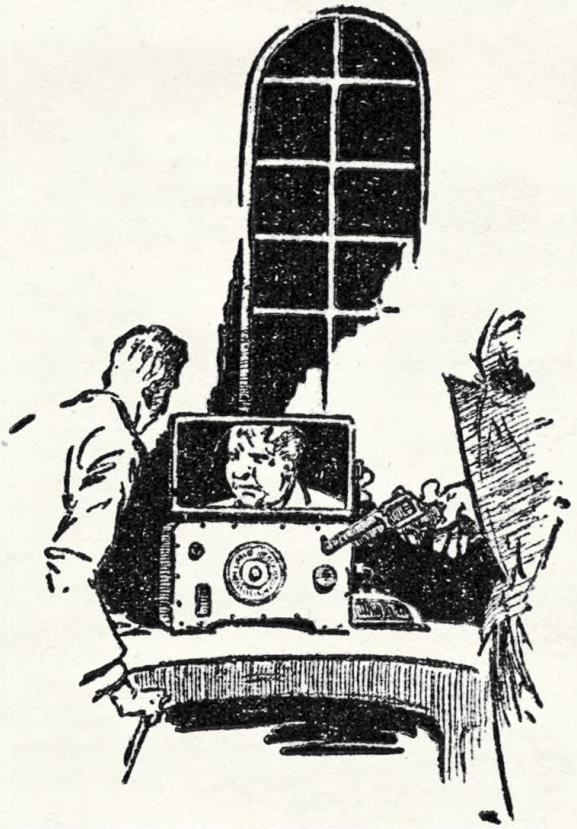


Lobby

by CLIFFORD D. SIMAK

It was a set-up for murder—a queer set-up, wherein the forces of order and progress advanced fastest by standing aside while their enemies destroyed the best hope of further progress!

Illustrated by Kramer

The lettering on the door read:

ATOMIC POWER, INC.

Felix Jones, reporter for the *Daily Messenger,* opened it.

"Hi," he said to the stenographer-receptionist. "Cobb in?"

"Not to you," she told him.

"I'll see him, anyhow."

Miss Joyce Lane shrugged her eyebrows. "I shall hold the door open," she said, "when he throws you out."

"Tsk, tsk," commented Felix. "What a temper!"

He moved toward the inner door.

"Do you bounce easy?" asked Miss Lane.

"I'm an expert at it," he assured her.

"So is Mr. Cobb," she said.

He opened the door and Bill Cobb looked up from his desk.

"It's you again," he said, unenthusiastically.

"You heard about Walker this afternoon?" asked Felix.

"I heard Walker," said Cobb. "I turned on the 'visor and there he was. Senator Walker is a doddering old fool and a rascally politician. You can quote me."

Felix walked across the room and perched on the desk. "You going to take it lying down?" he asked.

"I'm not taking it any way," said Cobb. "I didn't even think about it until you came in. You're wasting your time."

"You're not talking?" asked Felix, trying to sound surprised but not doing very well.

"Why should I?" Cobb demanded. "Would you give me a break? Not in a million years. But you'll print all the lies Walker and the power lobby and the Primitives shout against atomic power. If you want to take the words of a foul-ball politician and a half-baked sect, that's O.K. with me. Go ahead and make a fool out of your paper. Couple of years from now I'll come in and cram all those lousy stories down Mann's neck. You can tell him that."

"But Walker said atomics were dangerous—"

"Sure he said they were dangerous. He's been saying it for a year now. And he's right. They are dangerous. That's why we're not offering anything for sale. If some of the pure and holy power outfits that are fighting us had half as good a set-up as we have, they'd be selling right and left. Maybe a few people would get hurt, but what would they care."

He rapped the desk viciously with his pencil.

"When we have means to control atomic power, we'll put it on the market. Not before then. What do you think we put our experimental plant out in Montana for? Simply so that if it should blow fewer people would get killed."

"You're bitter," Felix said.

"Not bitter," Cobb told him. "Just astounded at what fools the people are. For years they've dreamed about atomic power. Reams of speculation have been written about it. Men have planned for it and banked on it, built future worlds on it. And now that it's within their grasp, what do people do? Now that they can practically reach out and touch power so ridiculously cheap it would be almost free, what do they say and think? They allow a power lobby and a bunch of crooked politicians to scare them silly with bogey stories about the terrible menace of atomics. They listen to yelping preachers on the street corner who tell them it's sacrilege to destroy God-created matter, that it's tempting Providence, asking the lightning to strike."

Felix hoisted himself off the desk.

"Scram," said Cobb.

"Now I know why Walker hates you," Felix said.

"So do I," said Cobb. "A million bucks a year."

He watched the reporter walk toward the door, called to him as he reached it. Felix swung around.

"Just one thing," warned Cobb. "If you write a line with my name in it . . . ever again . . . I'll come down to the office, personally, and break your neck."

"You're vicious," Felix told him and went out, shutting the door behind him.

Cobb tapped his teeth with the pencil, eyes still on the door.

"I should have plastered him," he told himself.

Through the open window came the droning of the New York sky lanes, the mutter of bank teller and shoe clerk and café waitress going home.

Rousing himself, he walked to the wall safe, twirled the combination and swung out the door. From a small box he took a sheet of paper, and carried it back to the desk. There he ran his finger down the left-hand margin, stopped at the notation—3 to 6 p.m. September 6th. Opposite it was a short-wave logging.

A nuisance, he told himself. And illegal, too. But the only way in which he and Ramsey could keep their wave length from being tapped.

He set the 'visor call dial, snapped up the toggle and punched the signal key. The screen lighted up and Scott Ramsey looked out at him.

"I've been expecting you," said Ramsey. "You listened to Walker?"

Cobb nodded. "I liked that part where he practically bawled over how the poor widows and orphans with their savings all tucked away in power securities would want for a crust of bread."

"It may sound laughable to us," said Ramsey, soberly, "but it got the senators. Mostly, I suppose, because they're the orphans who have their money socked away in power stocks. It's dirty politics, but we haven't seen the worst yet. We've got them scared, Bill, and when they get scared, they're dangerous. There's a rumor around we're ready to pop."

"Walker and his gang will be around with a proposition before long," predicted Cobb. "You know what to do."

"Sure. There was someone around this morning. But I don't think he was connected with the power lobby. Wanted to know how he could help us. I laughed at him. Said his name was Ford Adams. Mean anything to you?"

"Never heard of him," said Cobb. "Probably just a screwball."

"I'm afraid of something happening at the plant," declared Ramsey. "You better get hold of Butler. If you got time, it might be a good idea to go out and see him rather than just calling him. Impress on him the necessity to be on guard all the time. He's so tied up in his research he doesn't know

half what's going on."

"They wouldn't try anything at the plant," said Cobb.

"That's what you think," Ramsey told him. "This gang is all steamed up, I tell you. They're scared. They figure we're about due to go on the market any day now and they're half nuts. They know that once a successful atomic plant is developed they're dead ducks. To compete with us they'd have to sell their stuff for less than half of actual cost, probably even less than that. There are financial empires at stake, not only here, but all over the world. Men fighting for financial empires won't stop at anything."

"How about the department of interior?" asked Cobb. "You going to be able to hold that off?"

"I wish I could tell you yes," said Ramsey, "but I'm not too sure. Sullivan is getting budget jitters. If he doesn't play ball the power crowd can cut his budget to a shadow and leave him out on a long, bare limb. And he's not too happy about those nice, big dams he's got. Once atomic power comes in, the dams are shot. All they'll be good for is irrigation then and with this tank farming business, there isn't going to be too much need for irrigation.

"Then, too, he can slap an order on us to shut down until we can show we have developed adequate safety measures. It won't hold, of course, for we can prove we're doing experimental work and there's always some danger in that type of development. It's just a recognized fact. But he could hold us up a while."

"Do the best you can, Scott," urged Cobb. "No danger of Walker's law going through, is there?"

"Not this session. Most of them aren't too sure how the folks back home feel. Maybe it'll have a chance next session. Especially if the Primitives keep going to town. This town is plastered with soap boxes and spouting preachers. They say it's sacrilege—"

"Yes, I know. I've heard them. Any chance of proving the power gang is behind them?"

"Not a ghost," said Ramsey.

"O.K., then, I'll go see Butler tonight. Good luck with Sullivan."

The screen dimmed and Cobb clicked the toggle, carefully reset the dial to its legal wave length.

The intercommunicator buzzed at him and he flipped it open.

"Yes."

"A Mr. Adams here to see you," said Miss Lane. "A Mr. Ford Adams."

"I don't know any Ford Adams."

"He insists that it's important."

Ford Adams? Ford—

Yes, that was the name of Ramsey's screwball.

"I'll see Mr. Adams in a minute," Cobb said.

He picked up the slip of paper with the dial settings, put it back in the safe and locked it. Back at the intercommunicator he said:

"Send him in."

Ford Adams was tall, almost wraithlike. He walked with a limp

and carried a heavy cane. He laid it on the desk, saw Cobb look at it for a second.

"Sicily," he explained.

"I missed that one," said Cobb.

"You probably know I saw Mr. Ramsey this morning."

Cobb nodded and motioned to a chair.

"I offered my help," said Adams. "Mr. Ramsey didn't seem to take me seriously."

"What makes you think we need your help?"

"It's obvious," said Adams. "Here you are, a handful of you, fighting what amounts to a world combine. I've looked into the matter quite thoroughly and know much of the background. You offered your developments to the power corporations on condition they would form a world compact among themselves to hold their earnings to no more than their present earnings and, for a period of the next twenty years, would divert the greater portions of those earnings to converting the entire world to atomic power. They refused."

"Sure they did," said Cobb. "We expected they would, although we went to them in all good faith. They saw a chance to make a killing and they turned us down. They figured their own technicians could find the answers before we could begin operating. They guessed wrong. Butler is the only man in the field who found the answers and he had them when we talked to them. All the rest of the researchers are a million miles off base."

"You threatened you would ruin them," said Adams and he didn't make it an accusation or a question. It was simply a statement.

Cobb grinned crookedly. "As I remember it, we did. If they'd been decent, we'd gone in with them. Believe it or not, we aren't out to make a fortune. We probably won't. Butler is the head man with us and he doesn't even know there is such a thing as money. You've seen his kind. Has one ruling passion. The only thing that counts with him is atomic power. Not atomic power as a theory or as something to play around with, but power that will turn wheels—cheap. Power that will free the world, that will help develop the world. Power so cheap and plentiful and safe to handle that no man is so poor he can't afford to use it."

Adams fumbled with a cigarette. "What you've said, Cobb, may go for Butler," he declared, "but it doesn't go for you. You've lost sight of Butler's goal. It's become a game for you. A game in which either you or the power lobby wins. You're out to break the power gang."

"I hate their guts," said Cobb.

"You aren't a scientist," said Adams.

"No, I'm not. I'm a business man. Butler would be lost in the business end. So I'm here. He's out in Montana. It works O.K."

"But you aren't the only atomic company in the field."

Cobb laughed shortly. "You're thinking of Atomic Development. Forget it, Adams. You know as

well as I do Development is another power lobby trick. All it's done is sell stock. They've peddled it all over the world. Store clerks and stenographers are loaded with it."

Adams nodded. "At the psychological moment, it blows."

"And blows us with it," said Cobb. "The people in their blind panic, won't be able to distinguish between one atomic company and another. To them, we'll all be crooks."

"It isn't a pretty picture," said Adams.

Cobb leaned across the desk. "Just what do you mean by that?"

"It's sordid."

"The power gang asked for it that way," said Cobb. "They've bought off the papers with advertising campaigns. They've elected their men to Congress. They have organized a so-called religious sect to preach against us. They're bringing all the pressure they can in Washington. They've established a phony stock company for no other reason than to stir up a scandal that will smear us, too, when it busts wide open."

He smashed his fist on the desk. "If they want to play rough, it's O.K. with us. Before we're through with this we'll have them begging in the street. Those newspaper publishers who are bucking us now will come through that door over there on hands and knees and bow three times—and then we'll give them power to turn their presses."

"How about the world committee?" asked Adams. "You could appeal to it. Have it declare you an international project. No one could touch you then. You'd be free to work out atomic power without all the annoyance to which you are now subjected. Some arrangement could be worked out with the power companies. They'd see reason if the committee took a hand."

"We applied," said Cobb, "but apparently the committee can't be bothered. They're up to their necks in Europe and Asia. Figure the Americas should stagger along as best they can until some of the squabbles over there are ironed out."

"But it's not a question of the Americas," insisted Adams. "It's a question of the world. The whole world is concerned with atomic power."

"They wouldn't touch it with a ten-foot pole," declared Cobb. "It's too hot for them. Their powers are limited. The only reason they have lasted this long is that the little people of the world are determined there's never going to be another war, yell their heads off when anybody makes a move toward the world committee. But something like this—"

"Don't you see where this is leading?" demanded Adams. "If you let atomic power loose upon the world the way you propose to do, you're letting loose economic chaos. You'll absolutely iron out vast companies that employ hundreds of thousands of men and women. You'll create a securities panic, which will have repercus-

sions throughout the world, upsetting trade schedules which just now are beginning to have some influence toward a structure for enduring peace. You're not too young to remember what 1929 was like. That was just a ripple in comparison to the sort of chaos you can bring about."

"Adams," Cobb told him coldly, "you came in here and asked to help us. I didn't know who you were and I didn't ask. Isn't it about time to climb out of the tree?"

"I'm really no one," Adams said. "Just a private citizen with certain . . . well, you might call them eccentricities."

"Walker sent you," declared Cobb. "Walker or one of the power mob."

"I can assure you that is not so."

"Who did then? And what is the proposition?"

"There is no proposition," declared Adams. "Not now, at least. I did have something in mind, but there is no use in wasting time outlining it to you. When the power gang licks you, I'll drop around again."

"The power gang won't lick us," snapped Cobb.

Adams reached for his cane, pulled himself out of the chair, his fantastically tall, slender body towering over Cobb's desk.

"But they will," he said.

"Get out," said Cobb.

"Good-by, Mr. Cobb," said Adams. He limped toward the door.

"And don't come back," Cobb told him.

Cobb sat in his chair, cold with rage. If Walker thought such a thin deception would work—

The door opened and Miss Lane stood there, a newspaper clutched in her hand.

"Mr. Cobb," she said.

"What is it?"

She walked across the room and laid the paper down in front of him.

It was the *Messenger* and the screaming type of the headline smacked him in the face:

ATOMIC DANGEROUS, COBB FINALLY ADMITS

The peaks of the Absoraka range shone with white, ghostly light under the pale whiteness of a sickle moon that hung just above the jagged mountain saw-tooth.

The 'copter muttered, driving ahead, while below the darkness that was Montana slid away like a black and flowing river.

Cobb, pipe clenched between his teeth, leaned back comfortably in his seat, taking it easy, trying to relax, trying to think.

It had been clumsy of the power mob to send Adams. But it was possible that back of that clumsiness there might be some purpose. Perhaps they had meant him to detect Adams as their emissary, using him as a deliberate decoy against some other move that might be underway.

Adams, of course, had denied he had any connection with the power

lobby, but that was to be expected. Unless the power crowd was more desperate than he had reason to suspect, they probably wouldn't come out openly with a compromise at this stage of the game.

Cobb bent forward and stared out of the window of the machine, but all was darkness. Not even an isolated ranchhouse light. He glanced at his watch. Midnight.

His pipe went out and he lighted it again, watching the peaks swing nearer, still keeping their ghostly character. He noted the reading on his course and corrected it slightly.

Suddenly the sky above the peak flashed.

That was the word that best described it—flashed. There was no consciousness of fire, no flame, no glow—just a sudden, blinding flash, like a photographer's bulb popping —a million bulbs popping. A flash that came and lasted for one split second, then was gone, leaving a blackness that for a moment blotted out the moon and the snowy peaks —a blackness that persisted until one's eyes could readjust themselves.

The ship plowed on, while Cobb, blinded, reached out for something to clutch, instinctively reacting to the bewilderment of blackness.

Sound came. A sudden clap of sound that was vicious and nerve-wrenching. Like one short gasp of a million thunders rolled together.

The 'copter bucked and plunged and Cobb reached out blind hands, hauled back on the wheel to send it rocketing skyward. Beneath him the ship jerked and trembled, wallowing in tortured air.

Cold realization chilled Cobb's brain, tensed his body as he fought the bucking ship.

There was only one thing on Earth that could make a flash like that—a disintegrating atomic power plant!

The ship quieted and Cobb's eyes cleared. The moon still hung above the peaks. There was no glow above the range. There wouldn't be, Cobb knew. There'd be no fire . . . unless . . . unless—

He narrowed his eyes, trying to project his sight deeper into the night. There was no glow, no hint of fire. Just the night blue of the

sky, the silver of the mountain snow, the whiteness of the moon.

His breath came in gasps.

The blast apparently had been a blast and that was all. It had not set off a progressive disintegration. Probably all the fears that had been held on that account were groundless. Perhaps the blasting atoms destroyed themselves utterly, expanded all their power in one vicious flare of energy.

He pushed the machine down in a long, steep glide above the peaks, steeling himself for what he knew he'd see.

From far off he saw it, the jagged scar that snaked across the valley, the powdery gleam of riven rock, polished by the blast.

He held his breath as he swung above the scar. There was no sign of buildings, no sign of life, no smoke, not even the wavering of dancing motes of dust hanging in the air. There would be no dust, he knew. An atomic explosion would leave no dust. The dust itself would be a part of that bursting energy which had gouged out the hole across the valley.

He glided the ship toward the mountain spur that ran into the valley, brought it down on idling vanes. The spur, he saw, had been chopped off, cut off as a knife might slice through cheese, sheared in a straight and vicious line. A black hole gaped in the face of the spur and Cobb felt a surge of thankfulness.

At the end of that tunnel was the vault where Butler kept the records. If the blast had smashed the vault, blown it into nothingness, it would have wiped out the work of many years. But with the vault apparently intact—

The wheels touched the rock and rolled forward slowly. Cobb applied the brakes and cut the motor, flung open the door and jumped out.

Swiftly he headed for the tunnel, running up the slope.

Something moved in the tunnel's mouth, a weaving, staggering something. A man walking on wobbly legs, gripping a portfolio under one arm.

The man looked up and the pale moonlight slanted across his face.

"Butler!" Cobb cried.

Butler stopped, reached out a hand to steady himself. The portfolio fell to the ground and slid along the rock.

"Butler," yelled Cobb. "Butler, thank God!"

Butler's right hand came up and the moonlight gleamed on dull metal.

Butler's voice croaked at him. "Stay where you are!"

Cobb took another step forward.

"I'll shoot," croaked Butler. "I'll shoot, so help me—"

The gun barked, its muzzle flash throwing a swift red shadow on the man who held it.

"Butler, it's Cobb! Bill Cobb!"

The gun roared again and a bullet whined close.

"For the love of Mike," yelled Cobb.

The gun wavered and Butler's knees gave way. Cobb leaped for-

ward, but he was too late to catch the falling man. When he reached Butler, the scientist had tumbled forward, across the portfolio, guarding it even as he clawed feebly to regain his feet.

Cobb knelt and lifted him, bent low to hear the whisper.

"Got to get away," it ran. "Get into the hills. Got to—"

Cobb shook him and Butler's eyes flicked open.

"Bill," he said.

"Yes," said Cobb.

"Let's get out of here," Butler whispered. "The power mob. Spies. One of them . . . one of them—"

Cobb nodded grimly.

"The papers?" he asked.

Half croak, half whisper, Butler told him: "All here. All we need. The rest . . . mean nothing."

Swiftly, Cobb picked Butler up, cradling him in his arms, staggering toward the ship.

"Blast . . . knocked me . . . out," Butler said. "Came to after . . . while. Shaky . . can't talk good—"

"Shock," said Cobb.

It was a miracle, he knew, that the man hadn't been killed outright by the pressure and the flare of radioactive particles. The downward turn of the tunnel and the depth of the vault, he knew, was all that saved him.

With Butler in the ship, he sprinted back to pick up the portfolio and revolver then raced to the plane and took it up, vanes whirring wildly, sent it fleeing across the mountaintops.

"Doctor," croaked Butler.

"I'm taking you to one," said Cobb. "Sit back and take it easy. Keep yourself covered up."

Butler's hand reached out and plucked at his sleeve.

"What is it, Glenn?" Cobb asked.

"Maybe it . . . would be . . . better—"

"Take your time," cautioned Cobb. "Don't try too hard."

"—If they thought . . . I . . . was dead."

Cobb grunted. "Maybe it would, at that."

"Work in . . . secret . . . then."

"Sure, sure," said Cobb. "That's the idea."

He stared straight ahead into the blackness.

Work in secret. Underground. Skulking like criminals. Hiding from powerful men who saw in them a threat to empire.

And even if they did, where would they get the money? Atomic research took money, a lot of money. There had been trouble scraping together enough to build the plant—the plant that now was gone. Millions of dollars for a flash in the sky and a scar gouged in the ground.

Atomic Power Inc., he knew, was beaten, cleaned out. It was no more than a gilt name on an office door back in New York. And after tomorrow, after the newspapers and Primitives got through with them, it wouldn't even be that. It would be nothing—absolutely nothing.

There was, he told himself, bitterly, just one thing to do. Come morning and he would go down to

the *Messenger* office and beat up Felix Jones. He'd told Jones he would do that. Although Jones wasn't really to blame. He was just a newspaperman, one of many, doing the best he knew, writing what his boss wanted him to write at so many bucks a week.

The men he wanted to beat couldn't be reached—not now. There was only one way to beat them, take away the things they owned, smash the things they'd built, hold them up to pity and to ridicule. And now that couldn't be done.

Tomorrow those men would sit and gloat. Tomorrow—

He twisted his head around and looked back toward the misty peaks. The moon was sinking, the lower horn just touching the mountains.

Something floated across its face, a tiny thing with tiny spinning vanes. He watched it fascinated, saw the moon-glint strike like hidden fire against the blades.

Another helicopter!

Butler mumbled at him.

"Yes, what is it?"

"Doctor—"

"It's O.K.," said Cobb. "I'll take you to a friend of mine. He won't say a thing. Won't even know who you are. He won't ask and I won't tell him."

"Best way," said Butler.

Pale morning light was filtering through the windows when Cobb let himself into the office and hurried to the wall safe. Swiftly he spun the combination and thrust the portfolio inside.

"Good morning, Mr. Cobb," said a voice from the doorway.

Cobb swung about.

The man who stood there was tall and thin and carried a heavy cane.

"It was most fortunate about Butler," Ford Adams said.

"You are just too late," said Cobb. "If you'd caught up with me a minute sooner, you could have brained me with that stick. The portfolio would have been yours."

"I could have caught up with you any time," Adams told him. "But I wasn't interested in the portfolio. I wanted to talk to you again. Remember I said I would."

Cobb thrust his hands into his coat pockets, felt the hardness of the revolver he'd picked up back at the tunnel. Slowly his fingers curled around it.

"Come in," he said.

Adams limped across the room, laid his cane on the desk and sat down.

"There was a certain proposition—" he started to say, but Cobb stopped him with a gesture.

"Forget the proposition, Adams," Cobb said. "A hundred men died out in Montana tonight. Most of them friends of mine. Three or four million dollars of equipment and years of labor went up in a flash. You were out there. I saw a 'copter as I was leaving."

Adams nodded. "I was there. I followed you."

"Then," said Cobb, "it's time for you to talk."

His hand came out of his pocket and he laid the revolver on the desk.

"There is," said Adams, "no need for melodrama."

"There's no melodrama involved," Cobb told him. "If your explanation isn't good, I'm going to shoot you deader than a mackerel. If for no other reason than you know Butler is alive. What's simpler than that?"

"I see," said Adams.

"No one," said Cobb, "is going to ruin his chance again. Nor the world's chance, either. He's the only man today who can give the world workable atomic power. If something happened to him, no one knows how long the world would have to wait."

"You mean the power people would hunt him down if they knew he were alive?"

Cobb nodded. "They won't touch Ramsey or me. We don't count. We don't have the brain that Butler has."

The radio on the desk flashed a green light, chirped persuasively.

Cobb stared at it. The green light flashed again. The chirp seemed more insistent.

"It might be about Butler," Adams said.

Cobb reached out for the gun, swiveled it on Adams, then bent over the radio.

"One move," he warned.

"You needn't worry," said Adams. "My life is something I value very highly."

Cobb snapped on the radio. A puffy face came in the plate, a red face with tousled white hair and small, close set, green eyes. It was the face of Senator Jay Walker.

"MY THIRD ARM"

HE DIDN'T KNOW WHO HE WAS.

The records said he was 54 . . . *but he looked 30.*

The records said he lost a leg in World War II . . . *but he had both legs.*

Then he lost an arm in an accident . . . *and a new one grew from the stump.*

Why? Who? What manner of man was he?

Find out in THE CHANGELING by A. E. van Vogt, in the April issue of

ASTOUNDING
SCIENCE-FICTION

AT ALL NEWSSTANDS

"You!" snapped Walker.

"You called my wave length," Cobb declared.

Walker snarled. "I wasn't calling you. I didn't even know it was your length. Is there a man named Adams with you?"

Adams sat rigid in his chair.

"He asked me to call this wave length," the senator sputtered. "Said I'd learn something interesting."

"He's here," said Cobb.

Cobb backed away from the radio, motioned Adams forward with the gun. His lips formed soundless words. "What I said still goes."

"Naturally," said Adams. He spoke into the radio. "How are you, senator?"

"What do you want?" growled Walker.

"An atomic plant exploded in Montana tonight," said Adams. "More than one hundred men were killed."

"So," said the senator and one could hear the breath whistling through his lips. "So. Too bad."

"I have evidence," said Adams, "that would convict the men who planned it. Quite complete evidence."

"Men don't have to be involved in an atomic explosion," purred the senator. "The stuff's unstable, dangerous, hard to handle. *Pouf,* it goes like that."

"Men were involved in this one," declared Adams. "A lot of men. I thought you might know some of them."

"Mr. Adams, will you tell me who you are?" And the way the senator said it was an insult.

"I was formerly a member of the war guilt commission," Adams said. "At the moment I'm on the legal staff of the world committee at Geneva, Switzerland."

"And you—" said the senator. "And you—"

"I have evidence enough to hang about a dozen of you. You're one of the dozen, Walker."

"You'll never make it stick," stormed the senator. "It's blackmail. Bare-faced blackmail. We'll fight you—"

"You won't do any fighting," Adams told him. "You'll appear before a court of justice, the world court at Geneva. A lot different than other courts. You'll submit your defense and arguments in writing. There'll be no legal trickery or delay. There'll be no jury to talk into feeling sorry for you. The issue will be decided solely on merit. And there's no court of appeal."

"You have no jurisdiction," sputtered Walker.

"You won't be tried on fact of murder alone," said Adams. "The entire history of your attempt to impede the development of atomic power, a factor vital to world development and mankind's welfare, will be clearly shown. That is something clearly within our jurisdiction. And we can show that murder was one of the methods that you used."

"You'll never get away with it," snapped Walker.

"You're positively archaic," said Adams. "The day is gone forever when a million dollars can't be convicted. It went out the day the last Axis soldier died in the last fox hole of Japan. A lot of things went out that day, never to return. You're living in a new world, Walker, and you don't even know it."

Walker choked, wiped his face with a pudgy hand. "But you called me. You had a reason. What do you want?"

"All existing power installations in the world today," said Adams. "Complete restitution on all stock sold by Atomic Development. Full confessions for the record."

"But that—" gasped Walker. "That—"

"That's justice," Adams snapped. "No one would gain a thing by hanging you. This way you contribute to the world's welfare."

"But you haven't got atomic power," shrieked Walker. "Butler's dead and he's—"

Adams purred at him. "Why, senator, how did you you know that?"

Walker said nothing. His lips moved, but no words came. His face sagged and he was an old, old man.

"Cobb and I will see you this afternoon," Adams told him.

He snapped the toggle and turned around.

Cobb had laid the revolver on the desk.

"How close are you to working power?"

"A month," said Cobb. "Two months. No more. They got wind of it. Blasting the plant was the ace card they didn't want to use."

He found a cigarette, lit it with a shaking hand.

"You going to let them get away with it?" he asked.

"Get away?"

"Sure," said Cobb and his voice was hard. "They've committed murder. The law says death or life imprisonment, depending upon what court you face. It was murder, Adams, premeditated, cold-blooded murder. Done for profit."

"You want justice done?"

"Yes," said Cobb.

"Justice is an ideal," declared Adams, "very rarely arrived at. We have thought our courts signified and typified justice and in theory they did, but too often they failed in practice. Take Walker and his gang before any court in this land or any other land and what is the answer? You know it as well as I do. They'd wiggle out of it. They'd be represented by an array of legal talent that would confuse and becloud the issue, would get the jury so tangled up that it didn't know whether it was coming or going. Result: not guilty for lack of evidence."

"But a deal," protested Cobb. "A deal with criminals, with murderers."

"We have to be realistic," Adams said. "After all we're doing no more than any other court would do. We're turning them loose, letting them go free, but we, in this case, will accomplish something at

least. Something in the way of justice, something in the way of advancement for the world. No court, not even the international court, could confiscate a criminal's property. But let us say the criminal is conscience-stricken, that he wants to make restitution for the crime he has committed—"

"The people won't believe you," declared Cobb. "They'll know you made the deal."

"They won't mind," said Adams. "For one thing, they'd enjoy it too much."

Cobb frowned. "But a hundred lives—"

"Don't you see, Cobb, that this is bigger than a hundred men, any hundred men. For the first time the world is on the path to a balanced scientific government. This is the stroke of work that will entrench it. Until this moment the world committee has been weak, faced by all the hatreds of nationalism, all the greed of private enterprise, all the feudalistic ideas that have persisted through the years. It had to play safe and grab its chances as they came. And atomic power, international control and administration of atomic power, is the first step to real authority.

"Give the committee another hundred years and government by demagoguery will be gone. Little men with a talent for grabbing votes will have given way to men who make a profession of good government. Men who are trained for government just as doctors are trained for medicine or attorneys are trained for law. Men of science will govern, running the world scientifically in the interest of the stockholders—the little people of the world."

Cobb crushed out his cigarette. "If they hadn't blasted the plant, what then? If they hadn't handed you the club you used on them?"

"They would have won," said Adams. "We would have had to let them win. For we couldn't move until we had a club that would make them cower. We couldn't come out in the open. It had to be an undercover job. We've been working on this thing ever since you filed application for international status, but we had to keep it quiet. If the power gang had known we were interested, there'd be no world committee now. They would have smashed us flat—just as they smashed you. But in smashing you, they played into our hands.

"And that would have been too bad. For they—and many others—have no place in this new world. Their mentality doesn't fit them for a place in it. It's an old mentality, stemming from the Dark Ages and before, the idea of top dog eat underdog, of grab and hold."

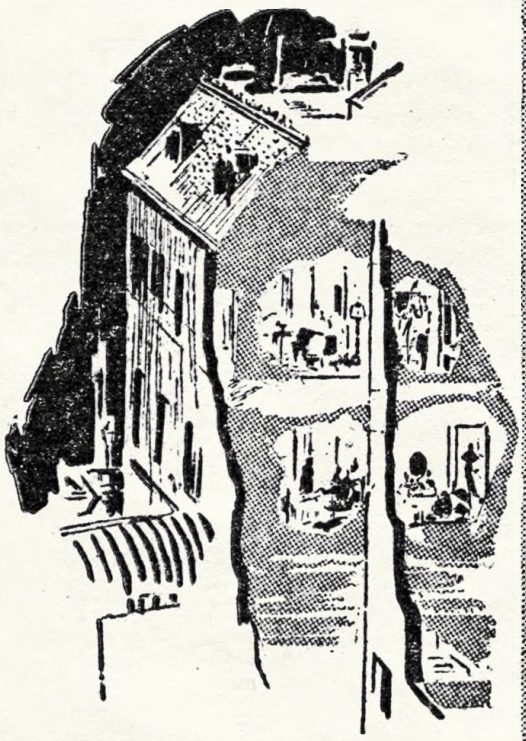
Banners of light in the east were pushing away the grayness of the dawn.

From far below came the first cry of a newsboy. From somewhere far off came the drone of an early worker's flier.

The city was awakening to a new day.

THE END.

Crime CAPTURES THE COUNTRY



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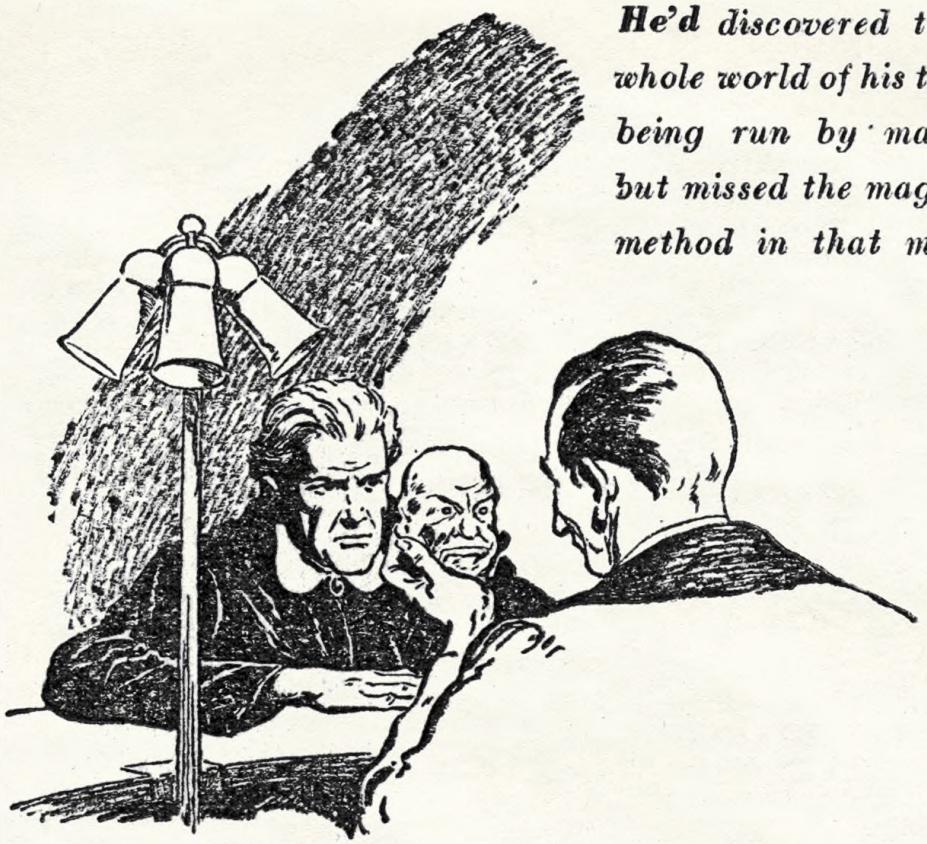


He'd discovered that the whole world of his time was being run by maniacs—but missed the magnificent method in that madness!

Sanity

by FRITZ LEIBER, JR.

Illustrated by Orban

"Come in, Phy, and make yourself comfortable."

The mellow voice—and the suddenly dilating doorway—caught the general secretary of the World playing with a blob of greenish gasoid, squeezing it in his fist and watching it ooze between his fingers in spatulate tendrils that did not dissipate. Slowly, crookedly, he turned his head. World Manager Carrsbury became aware of a gaze that was at once oafish, sly, vacuous. Abruptly the expression was replaced by a nervous smile. The thin man straightened himself, as much as his habitually drooping shoulders would permit, hastily entered, and sat down on the extreme edge of a pneumatically

form-fitting chair.

He embarrassedly fumbled the blob of gasoid, looking around for a convenient disposal vent or a crevice in the upholstery. Finding none, he stuffed it hurriedly into his pocket. Then he repressed his fidgettings by clasping his hands resolutely together, and sat with downcast eyes.

"How are you feeling, old man?" Carrsbury asked in a voice that was warm with a benign friendliness.

The general secretary did not look up.

"Anything bothering you, Phy?" Carrsbury continued solicitously. "Do you feel a bit unhappy, or dissatisfied, about your . . . er . . transfer, now that the moment has arrived?"

Still the general secretary did not respond. Carrsbury leaned forward across the dully silver, semicircular desk and, in his most winning tones, urged, "Come on, old fellow, tell me all about it."

The general secretary did not lift his head, but he rolled up his strange, distant eyes until they were fixed directly on Carrsbury. He shivered a little, his body seemed to contract, and his bloodless hands tightened their interlocking grip.

"I know," he said in a low, effortful voice. "You think I'm insane."

Carrsbury sat back, forcing his brows to assume a baffled frown under the mane of silvery hair.

"Oh, you needn't pretend to be puzzled," Phy continued, swiftly now that he had broken the ice. "You know what that word means as well as I do. Better — even though we both had to do historical research to find out."

"Insane," he repeated dreamily, his gaze wavering. "Significant departure from the norm. Inability to conform to basic conventions underlying all human conduct."

"Nonsense!" said Carrsbury, rallying and putting on his warmest and most compelling smile. "I haven't the slightest idea of what you're talking about. That you're a little tired, a little strained, a little distraught — that's quite understandable, considering the burden you've been carrying, and a little rest will be just the thing to fix you up, a nice long vacation away from all this. But as for your being . . . why, ridiculous!"

"No," said Phy, his gaze pinning Carrsbury. "You think I'm insane. You think all my colleagues in the World Management Service are insane. That's why you're having us replaced with those men you've been training for ten years in your Institute of Political Leadership—ever since, with my help and connivance, you became World manager."

Carrsbury retreated before the finality of the statement. For the first time his smile became a bit uncertain. He started to say something, then hesitated and looked at Phy, as if half hoping he would go on.

But that individual was once again staring rigidly at the floor.

Carrsbury leaned back, thinking. When he spoke it was in a more natural voice, much less consciously

soothing and fatherly.

"Well, all right, Phy. But look here, tell me something, honestly. Won't you—and the others—be a lot happier when you've been relieved of all your responsibilities?"

Phy nodded somberly. "Yes," he said, "we will . . . but" —his face became strained— "you see—"

"But—?" Carrsbury prompted.

Phy swallowed hard. He seemed unable to go on. He had gradually slumped toward one side of the chair, and the pressure had caused the green gasoid to ooze from his pocket. His long fingers crept over and kneaded it fretfully.

Carrsbury stood up and came around the desk. His sympathetic frown, from which perplexity had ebbed, was not quite genuine.

"I don't see why I shouldn't tell you all about it now, Phy," he said simply. "In a queer sort of way I owe it all to you. And there isn't any point now in keeping it a secret . . . there isn't any danger—"

"Yes," Phy agreed with a quick bitter smile, "you haven't been in any danger of a *coup d'état* for some years now. If ever we should have revolted, there'd have been"—his gaze shifted to a point in the opposite wall where a faint vertical crease indicated the presence of a doorway— "your secret police."

Carrsbury started. He hadn't thought Phy had known. Disturbingly, there loomed in his mind a phrase *The cunning of the Insane.* But only for a moment. Friendly complacency flooded back. He went behind Phy's chair and rested his hands on the sloping shoulders.

"You know, I've always had a special feeling toward you, Phy," he said, "and not only because your whims made it a lot easier for me to become World manager. I've always felt that you were different from the others, that there were times when—" He hesitated.

Phy squirmed a little under the friendly hands. "When I had my moments of sanity?" he finished flatly.

"Like now," said Carrsbury softly, after a nod the other could not see. "I've always felt that sometimes, in a kind of twisted, unrealistic way, you *understood.* And that has meant a lot to me. I've been alone, Phy, dreadfully alone, for ten whole years. No companionship anywhere, not even among the men I've been training in the Institute of Political Leadership—for I've had to play a part with them too, keep them in ignorance of certain facts, for fear they would try to seize power over my head before they were sufficiently prepared. No companionship anywhere, except for my hopes—and for occasional moments with you. Now that it's over and a new regime is beginning for us both, I can tell you that. And I'm glad."

There was a silence. Then—Phy did not look around, but one lean hand crept up and touched Carrsbury's. Carrsbury cleared his throat. Strange, he thought, that there could be even a momentary rapport like this between the sane and the insane. But it was so.

He disengaged his hands, strode

rapidly back to his desk, turned.

"I'm a throwback, Phy," he began in a new, unused, eager voice. "A throwback to a time when human mentality was far sounder. Whether my case was due chiefly to heredity, or to certain unusual accidents of environment, or to both, is unimportant. The point is that a person had been born who was in a position to criticize the present state of mankind in the light of the past, to diagnose its condition, and to begin its cure. For a long time I refused to face the facts, but finally my researches —especially those in the literature of the twentieth century—left me no alternative. The mentality of mankind had become—aberrant. Only certain technological advances, which had resulted in making the business of living infinitely easier and simpler, and the fact that war had been ended with the creation of the present world state, were staving off the inevitable breakdown of civilization. But only staving it off —delaying it. The great masses of mankind had become what would once have been called hopelessly neurotic. Their leaders had become . . . you said it first, Phy . . . insane. Incidentally, this latter phenomenon—the drift of psychological aberrants toward leadership—has been noted in all ages."

He paused. Was he mistaken, or was Phy following his words with indications of a greater mental clarity than he had ever noted before, even in the relatively nonviolent World secretary? Perhaps—he had often dreamed wistfully of the possibility—there was still a chance of saving Phy. Perhaps, if he just explained to him clearly and calmly—

"In my historical studies," he continued, "I soon came to the conclusion that the crucial period was that of the Final Amnesty, concurrent with the founding of the present world state. We are taught that at that time there were released from confinement millions of political prisoners—and millions of others. Just who were those others? To this question, our present histories gave only vague and platitudinous answers. The semantic difficulties I encountered were exceedingly obstinate. But I kept hammering away. Why, I asked myself, have such words as insanity, lunacy, madness, psychosis, disappeared from our vocabulary—and the concepts behind them from our thought? Why has the subject 'abnormal psychology' disappeared from the curricula of our schools? Of greater significance, why is our modern psychology strikingly similar to the field of abnormal psychology as taught in the twentieth century, and to that field alone? Why are there no longer, as there were in the twentieth century, any institutions for the confinement and care of the psychologically aberrant?"

Phy's head jerked up. He smiled twistedly. "Because," he whispered slyly, "everyone's insane now."

The cunning of the insane. Again that phrase loomed warn-

ingly in Carrsbury's mind. But only for a moment. He nodded.

"At first I refused to make that deduction. But gradually I reasoned out the why and wherefore of what had happened. It wasn't only that a highly technological civilization had subjected mankind to a wider and more swiftly-tempoed range of stimulations, conflicting suggestions, mental strains, emotional wrenchings. In the literature of twentieth century psychiatry there are observations on a kind of psychosis that results from success. An unbalanced individual keeps going so long as he is fighting something, struggling toward a goal. He reaches his goal—and goes to pieces. His repressed confusions come to the surface, he realizes that he doesn't know what he wants at all, his energies hitherto engaged in combatting something outside himself are turned against himself, he is destroyed. Well, when war was finally outlawed, when the whole world became one unified state, when social inequality was abolished . . . you see what I'm driving at?"

Phy nodded slowly. "That," he said in a curious, distant voice, "is a very interesting deduction."

"Having reluctantly accepted my main premise," Carrsbury went on, "everything became clear. The cyclic six-months' fluctuations in a world credit—I realized at once that Morganstern of Finance must be a manic-depressive with a six-months' phase, or else a dual personality with one aspect a spendthrift, the other a miser. It turned out to be the former. Why was the Department of Cultural advancement stagnating? Because Manager Hobart was markedly catatonic. Why the boom in Extraterrestrial Research? Because McElvy was a euphoric."

Phy looked at him wonderingly. "But naturally," he said, spreading his lean hands, from one of which the gasoid dropped like a curl of green smoke.

Carrsbury glanced at him sharply. He replied, "Yes, I know that you and several of the others have a certain warped awareness of the differences between your . . . personalities, though none whatsoever of the basic aberration involved in them all. But to get on. As soon as I realized the situation, my course was marked out. As a sane man, capable of entertaining fixed realistic purposes, and surrounded by individuals of whose inconsistencies and delusions it was easy to make use, I was in a position to attain, with time and tact, any goal at which I might aim. I was already in the Managerial Service. In three years I became World manager. Once there, my range of influence was vastly enhanced. Like the man in Archimedes' epigram, I had a place to stand from which I could move the world. I was able, in various guises and on various pretexts, to promulgate regulations the actual purpose of which was to soothe the great neurotic masses by curtailing upsetting stimulations and introducing a more regimented and orderly program of living. I was able, by humoring

my fellow executives and making the fullest use of my greater capacity for work, to keep world affairs staggering along fairly safely—at least stave off the worst. At the same time I was able to begin my Ten Years' Plan—the training, in comparative isolation, first in small numbers, then in larger, as those instructed could in turn become instructors, of a group of prospective leaders carefully selected on the basis of their relative freedom from neurotic tendencies."

"But that—" Phy began rather excitedly, starting up.

"But what?" Carrsbury inquired quickly.

"Nothing," muttered Phy dejectedly, sinking back.

"That about covers it," Carrsbury concluded, his voice suddenly grown a little duller. "Except for one secondary matter. I couldn't afford to let myself go ahead without any protection. Too much depended on me. There was always the risk of being wiped out by some ill-co-ordinated but none the less effective spasm of violence, momentarily uncontrollable by tact, on the part of my fellow executives. So, only because I could see no alternative, I took a dangerous step. I created" — his glance strayed toward the faint crease in the side wall—"my secret police. There is a type of insanity known as paranoia, an exaggerated suspiciousness involving delusions of persecution. By means of the late twentieth century Rand technique of hypnotism, I inculcated a number of these unfortunate individuals with the fixed idea that their lives depended on me and that I was threatened from all sides and must be protected at all costs. A distasteful expedient, even though it served its purpose. I shall be glad, very glad to see it discontinued. You can understand, can't you, why I had to take that step?"

He looked questioningly at Phy —and became aware with a shock that that individual was grinning at him vacuously and holding up the gasoid between two fingers.

"I cut a hole in my couch and a lot of this stuff came out," Phy explained in a thick naive voice. "Ropes of it got all over my office. I kept tripping." His fingers patted at it deftly, sculpturing it into the form of a hideous transparent green head, which he proceeded to squeeze out of existence. "Queer stuff," he rambled on, "Rarefied liquid. Gas of fixed volume. And all over my office floor, tangled up with the furniture."

Carrsbury leaned back and shut his eyes. His shoulders slumped. He felt suddenly a little weary, a little eager for his day of triumph to be done. He knew he shouldn't be despondent because he had failed with Phy. After all, the main victory was won. Phy was the merest of side issues. He had always known that, except for flashes, Phy was hopeless as the rest. Still—

"You don't need to worry about your office floor, Phy," he said with a listless kindliness. "Never any more. Your successor will have to

see about cleaning it up. Already, you know, to all intents and purposes, you have been replaced."

"That's just it!" Carrsbury started at Phy's explosive loudness. The World secretary jumped up and strode toward him, pointing an excited hand. "That's what I came to see you about! That's what I've been trying to tell you! I can't be replaced like that! None of the others can, either! It won't work! You can't do it!"

With a swiftness born of long practice, Carrsbury slipped behind his desk. He forced his features into that expression of calm, smiling benevolence of which he had grown unutterably weary.

"Now, now, Phy," he said brightly, soothingly, "if I can't do it, of course I can't do it. But don't you think you ought to tell me why? Don't you think it would be very nice to sit down and talk it all over and you tell me why?"

Phy halted and hung his head, abashed.

"Yes, I guess it would," he said slowly, abruptly falling back into the low, effortful tones. "I guess I'll have to. I guess there just isn't any other way. I had hoped, though, not to have to tell you everything." The last sentence was half question. He looked up wheedlingly at Carrsbury. The latter shook his head, continuing to smile. Phy went back and sat down.

"Well," he finally began, gloomily kneading the gasoid, "it all began when you first wanted to be World manager. You weren't the usual type, but I thought it would be kind of fun—yes, and kind of helpful." He looked up at Carrsbury. "You've really done the world a lot of good in quite a lot of ways, always remember that," he assured him. "Of course," he added, again focusing the tortured gasoid, "they weren't exactly the ways you thought."

"No?" Carrsbury prompted automatically. *"Humor him. Humor him.* The wornout refrain droned in his mind.

Phy sadly shook his head. "Take those regulations you promulgated to soothe people—"

"Yes?"

"—they kind of got changed on the way. For instance, your prohibition, regarding reading tapes, of all exciting literature . . . oh, we tried a little of the soothing stuff you suggested at first. Everyone got a great kick out of it. They laughed and laughed. But afterwards, well, as I said, it kind of got changed—in this case to a prohibition of all *unexciting* literature."

Carrsbury's smile broadened. For a moment the edge of his mind had toyed with a fear, but Phy's last remark had banished it.

"Every day I coast past several reading stands," Carrsbury said gently. "The fiction tapes offered for sale are always in the most chastely and simply colored containers. None of those wild and lurid pictures that one used to see everywhere."

"But did you ever buy one and listen to it? Or project the visual text?" Phy questioned apologetically.

"For ten years I've been a very

busy man," Carrsbury answered. "Of course I've read the official reports regarding such matters, and at times glanced through sample resumes of taped fiction."

"Oh, sure, that sort of official stuff," agreed Phy, glancing up at the wall of tape files beyond the desk. "What we did, you see, was to keep the monochrome containers but go back to the old kind of contents. The contrast kind of tickled people. Remember, as I said before, a lot of your regulations have done good. Cut out a lot of unnecessary noise and inefficient foolishness, for one thing."

That sort of official stuff. The phrase lingered unpleasantly in Carrsbury's ears. There was a trace of irrepressible suspicion in his quick over-the-shoulder glance at the tiered tape files.

"Oh, yes," Phy went on, "and that prohibition against yielding to unusual or indecent impulses, with a long listing of specific categories. It went into effect all right, but with a little rider attached: 'unless you really want to.' That seemed absolutely necessary, you know." His fingers worked furiously with the gasoid. "As for the prohibition of various stimulating beverages—well, in this locality they're still served under other names, and an interesting custom has grown up of behaving very soberly while imbibing them. Now when we come to that matter of the eight-hour working day—"

Almost involuntarily, Carrsbury had got up and walked over to the outer wall. With a flip of his hand through an invisible U-shaped beam, he switched on the window. It was as if the outer wall had disappeared. Through its near-perfect transparency, he peered down with fierce curiosity past the sleekly gleaming facades to the terraces and parkways below.

The modest throngs seemed quiet and orderly enough. But then there was a scurry of confusion—a band of people, at this angle all tiny heads with arms and legs, came out from a shop far below and began to pelt another group with what looked like foodstuffs. While, on a side parkway, two small ovoid vehicles, seamless drops of silver because their vision panels were invisible from the outside, butted each other playfully. Someone started to run.

Carrsbury hurriedly switched off the window and turned around. Those were just off-chance occurrences, he told himself angrily. Of no real statistical significance whatever. For ten years mankind had steadily been trending toward sanity despite occasional relapses. He'd seen it with his own eyes, seen the day-by-day progress—at least enough to know. He'd been a fool to let Phy's ramblings effect him—only tired nerves had made that possible.

He glanced at his timepiece.

"Excuse me," he said curtly, striding past Phy's chair, "I'd like to continue this conversation, but I have to get along to the first meeting of the new Central Managerial Staff."

"Oh but you can't!" Instantly

Phy was up and dragging at his arm. "You just can't do it, you know! It's impossible!"

The pleading voice rose toward a scream. Impatiently Carrsbury tried to shake loose. The seam in the side wall widened, became a doorway. Instantly both of them stopped struggling.

In the doorway stood a cadaverous giant of a man with a stubby dark weapon in his hand. Straggly black beard shaded into gaunt cheeks. His face was a cruel blend of suspicion and fanatical devotion, the first directed along with the weapon at Phy, the second—and the somnambulistic eyes—at Carrsbury.

"He was threatenig you?" the bearded man asked in a harsh voice, moving the weapon suggestively.

For a moment an angry, vindictive light glinted in Carrsbury's eyes. Then it flicked out. What could he have been thinking, he asked himself. This poor lunatic World secretary was no one to hate.

"Not at all, Hartman," he remarked calmly. "We were discussing something and we became excited and allowed our voices to rise. Everything is quite all right."

"Very well," said the bearded man doubtfully, after a pause. Reluctantly he returned his weapon to its holster, but he kept his hand on it and remained standing in the doorway.

"And now," said Carrsbury, disengaging himself, "I must go."

He had stepped on to the corridor slidewalk and had coasted halfway to the elevator before he realized that Phy had followed him and was plucking timidly at his sleeve.

"You can't go off like this," Phy pleaded urgently, with an apprehensive backward glance. Carrsbury noted that Hartman had also followed—an ominous pylon two paces to the rear. "You must give me a chance to explain, to tell you why, just like you asked me."

Humor him. Carrsbury's mind was deadly tired of the drone, but mere weariness prompted him to dance to it a little longer. "You can talk to me in the elevator," he conceded, stepping off the slidewalk. His finger flipped through a U-beam and a serpentine movement of light across the wall traced the elevator's obedient rise.

"You see, it wasn't just that matter of prohibitory regulations," Phy launched out hurriedly. "There were lots of other things that never did work out like your official reports indicated. Departmental budgets for instance. The reports showed, I know, that appropriations for Extraterrestrial Research were being regularly slashed. Actually, in your ten years of office, they increased tenfold. Of course, there was no way for you to know that. You couldn't be all over the world at once and see each separate launching of supra-stratospheric rockets."

The moving light became stationary. A seam dilated. Carrsbury stepped into the elevator. He debated sending Hartman back. Poor babbling Phy was no menace. Still—*the cunning of the insane.* He decided against it, reached out

and flipped the control beam at the sector which would bring them to the hundredth and top floor. The door snipped softly shut. The cage became a surging darkness in which floor numerals winked softly. Twenty-one. Twenty-two. Twenty-three.

"And then there was the Military Service. You had it sharply curtailed."

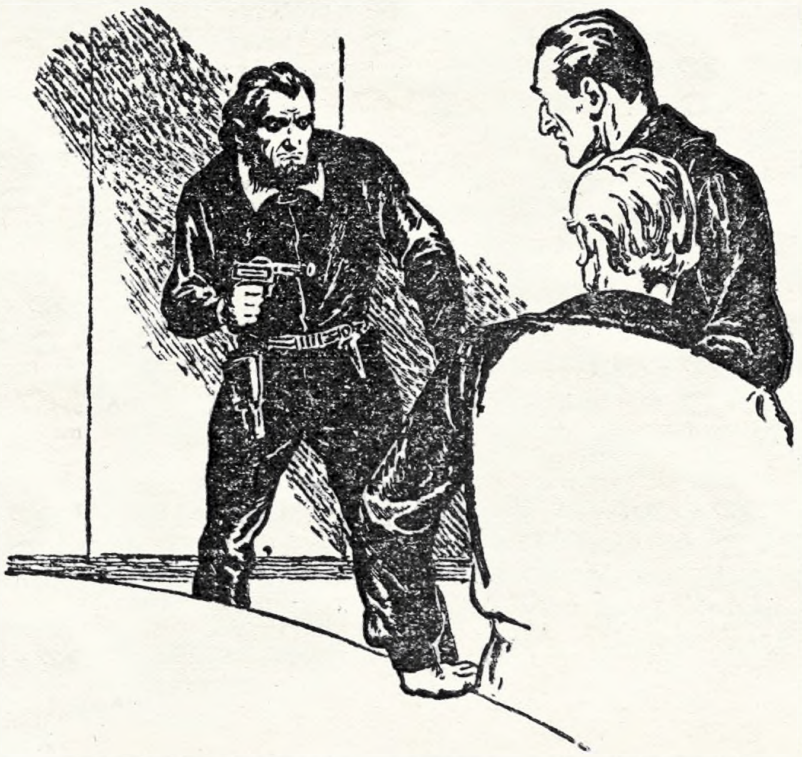
"Of course I did." Sheer weariness stung Carrsbury into talk. "There's only one country in the world. Obviously, the only military requirement is an adequate police force. To say nothing of the risks involved in putting weapons into the hands of the present world population."

"I know," Phy's answer came guiltily from the darkness. "Still, what's happened is that, unknown to you, the Military Service has been increased in size, and recently four rocket squadrons have been added."

Fifty-seven. Fifty-eight. *Humor him.* "Why?"

"Well, you see we've found out that Earth is being reconnoitered. Maybe from Mars. Maybe hostile. Have to be prepared. We didn't tell you . . . well, because we were afraid it might excite you."

The voice trailed off. Carrsbury shut his eyes. How long, he asked himself, how long? He realized with dull surprise that in the last hour people like Phy, endured for ten years, had become unutterably weary to him. For the moment even the thought of the conference over which he would soon be presiding, the conference that was to usher in a sane world, failed to stir



him. Reaction to success? To the end of a ten years' tension?

"Do you know how many floors there are in this building?"

Carrsbury was not immediately conscious of the new note in Phy's voice, but he reacted to it.

"One hundred," he replied promptly.

"Then," asked Phy, "just where are we?"

Carr opened his eyes to the darkness. One hundred twenty-seven, blinked the floor numeral. One hundred twenty-eight. One hundred twenty-nine.

Something cold dragged at Carrsbury's stomach, pulled at his brain. He felt as if his mind were being slowly and irresistibly twisted. He thought of hidden dimensions, of unsuspected holes in space. Something remembered from elementary physics danced through his thoughts: If it were possible for an elevator to keep moving upward with uniform acceleration, no one inside an elevator could determine whether the effects they were experiencing were due to accleration or to gravity—whether the elevator were standing motionless on some planet or shooting up at ever-increasing velocity through free space.

One hundred forty-one. One hundred forty-two.

"Or as if you were rising through consciousness into an unsuspected realm of mentality lying above," suggested Phy in his new voice, with its hint of gentle laughter.

One hundred forty-six. One hundred forty-seven. It was slowing now. One hundred forty-nine. One hundred fifty. It had stopped.

This was some trick. The thought was like cold water in Carrsbury's face. Some cunning childish trick of Phy's. An easy thing to hocus the numerals. Carrsbury groped irascibly about in the darkness, encountered the slick surface of a holster, Hartman's gaunt frame.

"Get ready for a surprise," Phy warned from close at his elbow.

As Carrsbury turned and grabbed, bright sunlight drenched him, followed by a griping, heart-stopping spasm of vertigo.

He, Hartman, and Phy, along with a few insubstantial bits of furnishings and controls, were standing in the air fifty stories above the hundred-story summit of World Managerial Center.

For a moment he grabbed frantically at nothing. Then he realized they were not falling and his eyes began to trace the hint of walls and ceiling and floor and, immediately below them, the ghost of a shaft.

Phy nodded. "That's all there is to it," he assured Carrsbury casually. "Just another of those charmingly odd modern notions against which you have legislated so persistently—like our incomplete staircases and roads to nowhere. The Buildings and Grounds Committee decided to extend the range of the elevator for sightseeing purposes. The shaft was made air-transparent to avoid spoiling the form of the original building and to improve the view. This was achieved so satisfactorily that an electronic warning

system had to be installed for the safety of passing airjets and other craft. Treating the surfaces of the cage like windows was an obvious detail."

He paused and looked quizzically at Carrsbury. "All very simple," he observed, "but don't you find a kind of symbolism in it? For ten years now you've been spending most of your life in that building below. Every day you've used this elevator. But not once have you dreamed of these fifty extra stories. Don't you think that something of the same sort may be true of your observations of other aspects of contemporary social life?"

Carrsbury gaped at him stupidly.

Phy turned to watch the growing speck of an approaching aircraft. "You might look at it too," he remarked to Carrsbury, "for it's going to transport you to a far happier, more restful life."

Carrsbury parted his lips, wet them. "But—" he said, unsteadily. "But—"

Phy smiled. "That's right, I didn't finish my explanation. Well, you might have gone on being World manager all your life, in the isolation of your office and your miles of taped official reports and your occasional confabs with me and the others. Except for your Institute of Political Leadership and your Ten-Year-Plan. That upset things. Of course, we were as much interested in it as we were in you. It had definite possibilities. We hoped it would work out. We would have been glad to retire from office if it had. But, most fortunately, it didn't. And that sort of ended the whole experiment."

He caught the downward direction of Carrsbury's gaze.

"No," he said, "I'm afraid your pupils aren't waiting for you in the conference chamber on the hundredth story. I'm afraid they're still in the Institute." His voice became gently sympathetic. "And I'm afraid that it's become . . . well . . . a somewhat different sort of institute."

Carrsbury stood very still, swaying a little. Gradually his thoughts and his will power were emerging from the waking nightmare that had paralyzed them. *The cunning of the insane*—he had neglected that trenchant warning. In the very moment of victory—

No! He had forgotten Hartman! This was the very emergency for which that counterstroke had been prepared.

He glanced sideways at the chief member of his secret police. The black giant, unconcerned by their strange position, was glaring fixedly at Phy as if at some evil magician from whom any malign impossibility could be expected.

Now Hartman became aware of Carrsbury's gaze. He divined his thought.

He drew his dark weapon from its holster, pointed it unwaveringly at Phy.

His black-bearded lips curled. From them came a hissing sound. Then, in a loud voice, he cried,

"You're dead, Phy! I disintegrated you."

Phy reached over and took the weapon from his hand.

"That's another respect in which you completely miscalculated the modern temperament," he remarked to Carrsbury, a shade argumentatively. "All of us have certain subjects on which we're a trifle unrealistic. That's only human nature. Hartman's was his suspiciousness—a weakness for ideas involving plots and persecutions. You gave him the worst sort of job—one that catered to and encouraged his weaknesses. In a very short time he became hopelessly unrealistic. Why for years he's never realized that he's been carrying a dummy pistol."

He passed it to Carrsbury for inspection.

"But," he added, "give him the proper job and he'd function well enough—say something in creation of exploration or social service. Fitting the man to the job is an art with infinite possibilities. That's why we had Morgenstern in Finance—to keep credit fluctuating in a safe, predictable rhythm. That's why a euphoric is made manager of Extraterrestrial Research—to keep it booming. Why a catatonic is given Cultural Advancement—to keep it from tripping on its face in its haste to get ahead."

He turned away. Dully, Carrsbury observed that the aircraft was hovering close to the cage and sidling slowly in.

"But in that case why—" he began stupidly.

"Why were you made World manager?" Phy finished easily. "Isn't that fairly obvious? Haven't I told you several times that you did a lot of good, indirectly? You interested us, don't you see? In fact, you were practically unique. As you know, it's our cardinal principle to let every individual express himself as he wants to. In your case, that involved letting you become World manager. Taken all in all it worked out very well. Everyone had a good time, a number of constructive regulations were promulgated, we learned a lot—oh, we didn't get everything we hoped for, but one never does. Unfortunately, in the end, we were forced to discontinue the experiment."

The aircraft had made contact.

"You understand, of course, why that was necessary?" Phy continued hurriedly, as he urged Carrsbury toward the opening port. I'm sure you must. It all comes down to a question of sanity. What is sanity—now, in the twentieth century, any time? Adherence to a norm. Conformity to certain basic conventions underlying all human conduct. In our age, departure from the norm has become the norm. Inability to conform has become the standard of conformity. That's quite clear, isn't it? And it enables you to understand, doesn't it, your own case and that of your proteges? Over a long period of years you persisted in adhering to a norm, in conforming to certain basic conventions. You were com-

pletely unable to adapt yourself to the society around you. You could only pretend—and your proteges wouldn't have been able to do even that. Despite your many engaging personal characteristics, there was obviously only one course of action open to us."

In the port Carrsbury turned. He had found his voice at last. It was hoarse, ragged. "You mean that all these years you've just been *humoring* me?"

The port was closing. Phy did not answer the question.

As the aircraft edged out, he waved farewell with the blob of green gasoid.

"It'll be very pleasant where you're going," he shouted encouragingly. "Comfortable quarters, adequate facilities for exercise, and a complete library of twentieth century literature to while away your time."

He watched Carrsbury's rigid face, staring whitely from the vision port, until the aircraft had diminished to a speck.

Then he turned away, looked at his hands, noticed the gasoid, tossed it out the open door of the cage, studied its flight for a few moments, then flicked the downbeam.

"I'm glad to see the last of that fellow," he muttered, more to himself than to Hartman, as they plummeted toward the roof, "He was beginning to have a very disturbing influence on me. In fact, I was beginning to fear for my"—his expression became suddenly vacuous—"sanity."

THE END.

IN TIMES TO COME

Next month, Wes Long gets a cover for the first time, on his yarn "Latent Image." We heard about the lens that keeps Pluto warm—according to Long—in "Circle of Confusion," from the viewpoint of the . . . well, I guess they're lensmen, too. This time we start on Pluto, the point being to get back to the lens in a large hurry, with only three small things interfering. 1. No spaceships bound for the lens, except (2.) that there's an experimental job, appropriately named the *Haywire Lady*, all ready to take off—only the experimental drive doesn't work. And (3.) the *Haywire Lady* has no pilot. All McBride has to do to get home is to find a pilot, and make the unworkable drive work! When he gets through, it's something new in drives. Decidedly. Its results are measured in feet per second per second per second—and the linotyper isn't stuttering!

E. Mayne Hull has an important item coming up next month, too—"The Winged Man." It's a two-part serial that starts when a wing man kidnaps a U. S. Navy submarine—complete with crew. The ransom demanded is simple enough; mix-in in the private war of the year approximately 1,000,000 A.D. The logic of the situation is not so simple, though; the sub crew are not alone in the kidnaped-class. There are warships, pleasure ships, spaceships, and what not of a good many ages on the spot. But the winged men's enemies are under the sea—and the sub alone can reach them. The sub has to join the fight—or not get back in time. The question is not whether, but how, on which side—

The Editor.

Brass Tacks

Why not demand something more useful, like an automobile with a built-in gasoline well?

Dear Mr. Campbell:

I am herewith replying to the S O S in Mr. Leinster's little story in the November Astounding.

The solution is obvious. Stinky, unable to reach Llanvabon, should be so superimposed on "normal" space that Stinky's rooms coincide in both spaces. Then one has merely to interchange the spaces. Stinky can enter Llanvabon by the indubitable process of walking. Once in, he can wander, still walking, outside that part of Llanvabon still in "normal" space. Now he is ready to go back to work. In the interchange of spaces, Professor Bolton's office or library should certainly swap with a section of some rocky and impossible geological formation. This should make Bolton more interested in Stinky's theories. Needless to say, Stinky's rooms should be returned to their proper spaces.

The proper reward for this airtight solution would be a few bottles of the Caecuban wine beloved of Horace. If this isn't handy, I will accept Falemian. If, after a reasonable time, the wine is lacking, I shall read a book by Bertrand Russell and (1.) Doubt Stinky's ability to stay in Llanvabon; (2.) Doubt Stinky's ability to leave Llanvabon.—George Milwel, 918 Temple Avenue, Knoxville, Tennessee.

We feel lucky to get paper enough for the present microscopic magazine, let alone new ventures.

Dear Mr. Campbell:

I have just finished reading W. A. Carruther's letter in "Brass Tacks," November issue. It started the following train of thought:

Why not have your best serials—novelettes—of the last ten years published in pocket size book form,

two or three serials *complete* in each issue?

I've read Astounding for the past ten or eleven years, and much to my disgust, have missed many an issue, which carried one of the installments of a serial.

Also, I'd like to have a collection of the best Astounding S. F. serials, or even all of them, published during the past ten years, which, otherwise, I will never be able to collect.

I think many Astounding readers will agree with me in asking for pocket size booklets of your best serials to enlarge their libraries. I feel positive that should you publish such a series, they would meet widespread approval.—Henry G. Higgins.

I particularly liked van Vogt's point on the inevitable disappointment of the 500-year-long voyagers. It's a bad, but human habit to overlook human progress.

Dear Mr. Campbell:

The January Astounding represents a distinct improvement over the last few issues. Hope this will continue.

In the first place, the cover is easily the best Timmins has done. The unusual and effective choice of colors, the dramatic quality, and the faithfulness to the story make this considerably better than any of last year's jackets.

The articles are downright fascinating. "A Matter of Taste," read like fiction. Are you sure Ley wasn't on a Muchomor spree when he wrote it?

And, of course, the stories.

1. "Technical Error:" I haven't got this story figured out yet—especially those metal rings that were found by the inner airlock—but that's O.K. I didn't understand all of "Martian Odyssey," either. Weinbaum is really about the only author to whom Clement can be compared. Authors like Schachner and Simak may write more fantastic and less plausible stories, but there's usually that omnipresent bias in favor of our human society and technology. Clement cuts his imagination loose, and without sacrificing plausibility gets an effect of complete alienness that is rarely found. A+.

2. "Far Centaurus:" Science-fiction implies several problems in psychological adjustment which most writers, in their preoccupation with plot, refuse to recognize. The he-and-she-alone-on-a-planet situation, which van Vogt took up rather half-heartedly in "The Storm" a few months ago, might have the makings of a good story, but "Storm" didn't click because the problem was dodged. Not only were the castaways rescued by a wildly improbable chance, but, even more unlikely, they married after their return to civilization—an ending the reader had been given no cause to expect. Besides this, there was no hint until the story was half over that the castaway problem was to be the subject of the story; it looked as if the fate of the Fifty Suns was what the author was worrying about.

In "Far Centaurus" the problem

is more difficult and the solution more logical and much less dependent on chance, making a much better yarn. Whether you can get yourself to believe in van Vogt's "bachelor suns" doesn't matter; it is quite credible that the Centaurians would have some time-travel method, and almost inevitable that they would send the three explorers back, so altogether the solution holds water pretty well—block that metaphor!—even though it wasn't supplied by Renfrew, Blake, and Endicott. A.

3. "As Never Was:" Miller's narrator asks how the cycle ends. It seems perfectly obvious to me. Every "time" Toynbee brings back the knife it is a little smaller, because, it has traveled through time once more and one more chip has been taken out of its blade for analysis. Finally so little is left that Toynbee doesn't even notice it, but digs around for something else instead—finding the original, whole knife, and starting the cycle again. Or does he? B+.

4. "The Leech:" Present knowledge of brain waves gives very little promise of the mind-reading machine Cranborne invents with so little trouble. But this is a good enough thud-and-blunder story that a certain amount of implausibility can be forgiven. B—.

5. "Ogre." An utterly incredible nightmare, peopled with fantastic, but uninteresting, monsters. Simak's aliens are too human, and his men insufficiently human. See my remarks anent "Technical Error," above; they are to be applied to this story in reverse. The description of "Melody Bowl" sounds like the "night-club planet" in a Probability Zero tale some time ago.

Simak doesn't achieve even a good adventure story; his insistence on philosophizing bogs the thing down in the middle and it never recovers. C.

6. "Alias the Living:" I don't believe a word of it. C.

Prob Zero:

1. "Picture from Tokyo."
2. "Light Trap."
3. "Cash on the Dimension."

There are two conflicting theories among your authors on the constitution of the crew of an exploring spaceship. One, represented by van Vogt's monster stories, is that such a ship should be equipped with every type of scientist, even, perish the thought, with a sociologist. The other, represented by "Far Centaurus" in this issue, is that the inventors of the space drive and their college friends, all entirely without qualifications, should man the ship. P. S. Miller once expressed still another view: that for the actual operation of the ship one man should be sufficient.

Of course it depends on the purpose of the trip. But take the two cases of the first lunar rocket and the first interstellar ship. How large a crew? How many trained explorers aboard? and should care be taken to have both sexes represented? Let's have some discussion of this.—Chandler Davis, Cambridge, Massachusetts.

Guess Koalas will never rule the planet!

Dear Mr. Campbell:

Thanks for running Ley's "Matter of Taste"; much the best thing in the issue. The boys might like a couple of addenda:

(1) The limitations of the diet of some animals do go to remarkable extremes: witness the koalas, who die if they eat anything but the leaves of certain species of eucalyptus · and which are difficult to keep in captivity, not only because of the trouble of getting the right kind of leaves, but because of the limitations of their poor little marsupial brains, which cause them to eat anything offered to them, including Hershey bars with the foil on. On the other hand supposedly monophagous beasts sometimes show a startling adaptation. The Bronx Zoo has found that giant anteaters thrive on scrambled eggs. And about ten years ago they had a lesser panda which refused everything, its proper diet of bamboo shoots being unavailable. When it had almost starved to death its keeper in desperation tried some patent baby cereal, which worked fine. The creature lived on this stuff for months. About lions: it's true that food as starchy as potatoes is pretty hard on them, but some lions have been reared on a mixed meat-vegetable diet. They turned out just as healthy and just as likely to eat their keepers as those brought up on straight meat.

(2) Octopus is something like lobster and something like old inner-tube; rather tough and salty, but

This blade lasts long and serves you well—
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with a pleasant flavor. A friend of mine once ate a sea urchin, but said it tasted exactly like the rest of the Pacific.—L. Sprague de Camp.

Fantasy—but not the werewolf—vampire type, perhaps?

Dear Mr. Campbell:

By all means, let's have fantasy in Astounding. I haven't the slightest doubt that "We Print the Truth" was destined to be the lead novel in an issue of *Unknown.* So, when *Unknown* was obliterated by the paper shortage, you published it in Astounding, which resulted in its being voted the second best yarn in the issue.

Unknown was undoubtedly the greatest fantasy magazine of the last decade. I've had my issues professionally bound, for I'm positive that, included between the covers of the thirty-nine issues of *Unknown,* are some of the greatest fantasy stories of our age.

Some of your "regulars" write finer fantasy than science-fiction, and it would be a crying shame to hold them down to a type of story not strictly their forte.

Surely the most inveterate science-fiction addicts will not begrudge we, who lean towards the fantasy side of imaginative fiction, at least one story per issue.—Walt Liebscher, Slan Shack, 25 Poplar, Battle Creek, Michigan.

Well, twenty pounds of magnet wire, an old transformer and a discarded radio set will do it—

Dear John:

1. Aunt Hattie is living at our house this winter.

2. Aunt Hattie has taken to reading Astounding Science-Fiction.

3. In the story "Recoil" the boys on "Venus Equilateral shoot pirates with something called a "betatron."

4. In the next story "Off The Beam," the hero "Channing" casually inquires for "ten pounds of No. 18 wire" and implies it is the principal requirement for a betatron.

5. Aunt Hattie knows I have twenty or more pounds of No. 18 magnet wire.

6. Aunt Hattie wants to know why I don't build a light small caliber betatron—a sporting model so to speak—and shoot the mice who have been thumbing their noses at traps and holding a jitterbug session in the partitions all winter!

7. I have tried to explain that the betatron and the mice and myself would all have to be in a vacuum or it wouldn't work—and I'd have to have a space suit.

8. She will not believe me because Flash Gordon's ray pistol does not work that way.—George A. Foster, Stoughton, Massachusetts.

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